Senior Secondary Course

HOME SCIENCE (321)

321en

विद्याधनम् सर्वधनं प्रधानम्

NATIONAL INSTITUTE OF OPEN SCHOOLING
(An Autonomous Institution under MHRD, Govt. of India)
A-24-25, Institutional Area, Sector-62, NOIDA-201309 (U.P.)
Website: www.nios.ac.in, Toll Free No. 18001809393

NIOS SENIOR SECONDARY - HOME SCIENCE (321)

Complete Textbook (34 Lessons)

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1

HOME, FAMILY AND HOME SCIENCE

'*H*ome sweet home' - yes we all have a home a where we live with our family and enjoy the feeling of belongingness. Our family consists of father, mother, brother (s), sister (s) and at times other relatives who live under a common roof to form a household. In a household the woman - a wife or mother plays the major role of homemaking by managing the household activities. But the perception of homemaking has gradually changed. Today, the man and the woman jointly share the responsibilities of home and family. It is for this reason that both men and women should have knowledge regarding family well-being and make attempts to improve the living standard of the family. In this context the subject of Home Science caters to the needs of both boys and girls.

This lesson brings to you the meaning, aim, importance and scope of Home Science and the job avenues that it can open before you.

OBJECTIVES

After studying this lesson you will be able to:

- define the term home, family and Home Science;
- explain the meaning, aim, importance and misconceptions about Home Science as a subject;
- discuss the various areas of Home Science in terms of skill development;
- list various vocational opportunities for wage and self-employment.

1.1 MEANING OF HOME SCIENCE

Home Science consists of two words, that is, 'Home' and 'Science'. The word *'home'* refers to the place of residence where the family lives. The word *science* refers to knowledge based on facts, principles and laws. By combining these two words the meaning of Home Science can be derived as 'application of scientific knowledge in a systematic manner towards improving the quality of home and family life'.

Since Home Science is concerned with various aspects of daily living that includes food, shelter, clothing, health, resources and services, the subject draws principles from related subjects of arts and sciences. These principles are then applied to promoting healthier and happier living. Home Science thus becomes an art and science of daily living.

Let us see how Home Science serves as the *art* and *science* of living. In Home Science you will learn about nutrients, food groups, balanced meals, etc., that will improve your scientific knowledge. When you use this knowledge for preparing nutritious food then it is *science* but when you serve the food in an attractive manner then it is *art.* Similarly, when you learn about textiles, fibre, fabric, etc, along with their properties and care, that will be called *science* but when you design and stitch garments and do embroidery to beautify the garment then it is an *art.* You will use this combination of *science* and *art* in many spheres of daily living.

Activity 1.1: Observe the combinations of science and art in your daily life. Give at least one example each for the following:

S.No.	The Science and art	Example
1.	The meal that you eat	
2.	The clothes that you wear	
3.	The arrangements in your kitchen	
4.	Caring for a child	

1.2 AIM OF HOME SCIENCE

Since education in Home Science is concerned with yourself, your home and family and the resources needed for well-being of individuals, the subject

aims at providing maximum satisfaction to you and your family for harmonious living. The subject also builds up scientific knowledge and skills for daily living. Besides this, Home Science also prepares you for many opportunities to enter into the job market for:

- *Career:* A chosen profession or occupation for self-advancement
- *Vocation:* A regular occupation for which an individual is particularly suited or qualified
- *Wage employment:* Earning salary or wages by working for someone or some organization
- *Self-employment:* Income earning activity by being owner of the activity
- *Entrepreneurship:* Small scale innovatrie business to earn a profit.

1.3 IMPORTANCE OF HOME SCIENCE

Home Science gives knowledge for facing new challenges, to cope with knowledge explosion, technological advancements, new developments and growing needs of individuals for successful living in society. Home Science is one such subject that trains you to face with confidence, the challenge of changing times for attaining satisfaction and harmonious living.

- **Importance for individuals**

Home Science will give you scientific knowledge and develop skill for efficient performance of household responsibilities. Skill is the process of applying theory based knowledge into your daily life. For example, countering social pressures to adopt unhealthy eating practices by refusal is a skill. Seeking services for help with sexual issues is another skill. Developmental of positive skill leads us towards happiness and satisfaction.It will also prepare you to take up wage or self-employment.

- **Importance for home and family life**

The emphasis in Home Science is to strengthen home and family life by making an optimal use of available resources. It will help you to apply knowledge of different sciences for improving home and family environment, health, growth and development of individuals and in managing your household resources. This is the only subject that deals with food, clothing, shelter, health, human relationships, household resources and concerns of individuals that exist within a home and in a family.

Family is the smallest social unit of a community. The contribution of Home Science in the overall enrichment of family helps in the development of community and nation at large.

- **Importance for economic stability**

Different areas of Home Science prepare you for a variety of jobs. The economic stability of the family can be ensured by undertaking a job or self employment. This will further lead to raising the living standard of the family and quality of life.

INTEXT QUESTIONS 1.1

1. Fill in the appropriate word in the blank space -
   a. A place where we reside _____
   b. One who discharges household responsibilities _____
   c. Subject that promotes healthier and happier living _____
   d. Earning salary by working for someone or in some organization _____
   e. Small scale innovative business for making a profit _____

2. Tick (√) mark the correct answer. Give a reason to justify your answer.
   (i) Home Science caters to the needs of daily living of
      a. boys only
      b. girls only
      c. both boys and girls
      d. the society

      Because .....

   (ii) Home Science applies knowledge for well-being of individuals by drawing principles from
      a. science alone
      b. arts alone
      c. sometimes science and sometimes arts
      d. both science and arts

      Because .....

1.4 MISCONCEPTIONS REGARDING HOME SCIENCE

For a lay person Home Science seems to mean cooking, stitching and decorating the home. But in reality Home Science is much more than these. It is a subject that teaches you the science and art of performing homemaking tasks and attending to household chores. At the same time it also prepares you for various vocations.

Despite the significance of the subject there are many misconceptions. There is a need to eliminate these. Let us consider the facts related to misconceptions.

Misconception* : *Home Science only teaches cooking, stitching, home decoration and child care.

Fact: We can not deny the fact that food, shelter and clothing are the basic needs of daily life. Home Science includes these aspects with an emphasis on building scientific knowledge. For example, we do not eat food just to satisfy our hunger but we eat food to meet the nutritional requirements of our body that contribute to promoting growth and development, provide energy for doing various activities and for regulating various body functions. This we learn in one of the areas of Home Science. The aspect of cooking that is taught under the subject of Home Science deals with principles and methods of cooking for preventing loss of nutrients and adding variety, balance and nourishment in the diet. So the fact is that though Home Science teaches cooking, it is based on the science and art of cooking.

Similarly, there can be numerous examples to support the relationship of science and art. When you will study about clothing, grooming, personality development, personal and environmental hygiene, management of resources like time, money and energy; care of children and elderly you will find that the principles of science are deep rooted in Home Science. They help to build scientific temperament for its application in daily life. Thus Home Science caters to betterment of mankind and improves homemaking skills.

Misconception* : *Home Science is meant for girls because they have to manage the home in later life.

Fact: Today, there is a predominance of the nuclear family structure. The man and the woman share responsibilities. Moreover, the number of wage earning homemakers are gradually increasing which means that there is pressure of dual responsibility on women. In other words we can say that the woman combines her homemaking responsibilities with generating income for the family. Under such conditions, the work load of women should be shared by the men. Home Science orients and prepares both men and women to deal

Fact : 49% of learners opting to study Home Science at NIOS are males!

with various aspects of life. It is therefore wrong to say that Home Science is meant for girls alone. We must change our mindset and accept that Home Science is beneficial for boys also.

Misconception : Why study Home Science when girls can learn homemaking skills from their mother?

Fact: Yes, girls do learn many homemaking skills from their mother but by studying the subject of Home Science they can find answers to why, how and when of doing these activities. For example, why is oil used for making pickle? A layman's answer will be to preserve the pickle. But how does oil preserve the pickle? In Home Science you will learn that oil prevents the direct contact of air with the preserved item like mango and prevents spoilage. You will find numerous such examples and scientific reasoning when you study Home Science. Therefore, the fact is that though we learn many things from our mother, supplementing these with scientific reasoning helps us to do things in a more organised manner.

Fig. 1.1

Misconception : Home Science does not offer attractive job opportunities.

Fact: A variety of job opportunities in different areas of Home Science are available after studying the subject at school level. There is no other subject that opens up the avenues for such a variety of jobs. Moreover, Home Science also prepares you for self-employment or for starting small enterprises. We will discuss the job opportunities in detail a little later in the lesson.

1.5 AREAS OF HOME SCIENCE

Home Science is a composite subject that deals with daily life situations. Accordingly, it consists of those areas that are related to our life. Home Science has five different areas but at school level only four areas are taught. Each area of Home Science along with its sub-components that you will be studying, is listed as under:

Table 1.1

Area	Sub-components
Food and Nutrition	Food; nutrition; meal planning; nutritional status, health and care of sick; purchase and storage of food; food preservation.
Resource Management	Consumer education, work ethics, income management, savings and investments, work

	and space organization, time and energy management, conservation of energy and environment management.
Human Development	Development in early and middle childhood, adolescence, special issues in human development.
Textiles and clothing	Fabric science and its construction; textile finishes, selection, care and maintenance.

Note: At college level one more area, Extension Education, is taught as a subject.

1.6 SCOPE OF HOME SCIENCE

The scope of each area of Home Science along with skill building for daily living has been explained in Table 1.2.

INTEXT QUESTIONS 1.2

1. List any three misconceptions about Home Science
   (i) .....
   (ii) .....
   (iii) .....

2. Write any two scope(s) for each area of Home Science

a. .....
   .....

b. .....
   .....

c. .....
   .....

d. .....
   .....

1.7 JOB OPPORTUNITIES IN HOME SCIENCE

In section 1.2, you have already learnt about the terms that are used in a job market. Before we study about different job opportunities, let us try to understand the terms that are related to job opportunities. You can be a *wage employee* by working in a bakery or boutiques or a day care center. But you will be called *self employed* when you manage your own bakery, boutique or

Table 1.2 : Area-wise scope and skill building for daily living

Scope	Skill building for daily living
Area: Resource Management	• Ability to recognize the rights and responsibilities of a wise consumer
• Becoming a consumer conscious individual	• Ability to use consumer aids while purchasing goods or using services
• Wisely managing family income and expenditure	• Consciousness building regarding consumer protection laws
• Recognizing the need for saving money and making investments	• Aptitude to manage expenditure within the available income
• Adopting work simplification measures for overcoming fatigue and managing time and energy	• Proficiency in saving money
• Recognizing the mutual relationship between space organi-zation and aesthetics	• Ability to take maximum benefit of saving and investment schemes
• Optimally utilizing and conserving energy sources around you	• Dexterity in making a time plan and using work simplification methods for saving energy
• Developing eco-friendly consci-ousness	• Expertise in space organization for performing various household activities
• Developing aptitude for work ethics and ethical standards in daily living	• Discernement in using renewable and non-renewable sources of energy at home
	• Ability to prevent environment degradation and use eco friendly products and practices
	• Appreciating the value of code of ethics
Human Development	
• Recognizing different aspects of development from early to late childhood	• Competence in caring for the child as per physical, motor, social, emotional, language and cognitive development
• Understanding the physical changes, developmental tasks, characteristics and problems of adolescents	• Aptitude for facilitating the sound development of adolescents
• Being sensitized towards special issues in human development	• Proficiency in managing and caring for people with special needs
Fabric Science	
• Wisely selecting fabric for different end uses	• Expertise in identification and selection of fabric appropripate to end use
• Getting acquainted with different textile finishes and using simple techniques for fabric enrichment	• Deftness in using textile finishes for fabric enrichment
• Wisely selecting and maintaining clothing and textiles	• Ability to buy clothing and textiles by judging quality and labels
	• Competence in laundering and storage of clothes.
	• Capability to protect the health of the family by providing nutritionally rich food
Food and Nutrition	
• Recognizing the interrelationship of food, nutrition and health	• Competency in preparing balanced meals to suit the nutritional requirement of individuals
• Planning and preparing balanced meal as per nutritional requirement	• Proficiency in meal planning as per signs and symptoms of nutritional status and deficiency diseases
• Planning and preparing theraputic meals for the sick	• Aptitude for modifying diet for sick persons and nutrition related health problems
	• Expertise in assessing nutritional status and recognizing signs and symptoms of common nutritional deficiency diseases
	• Ability to use appropriate storage and food preservation methods.

day care center. You will be called an *entrepreneur* when you undertake income earning project as a small scale business. After studying Home Science at school level you will find many opportunities to be a wage earner or self-employed or an entrepreneur.

The possible job opportunities for wage employment, self employment and entrepreneurship at the entry level or after successfully completing senior secondary education may be:

A. Opportunities for wage employment

- Staff of consumer organization/forum
- Advisor of consumer rights
- Sales representative of consumer goods and services
- Representative of saving and investment schemes
- Employee of saving and investment schemes
- Staff in show rooms of furniture, equipment and other household goods, government emporium, craft centers, production units of household commodities
- Employee in nursery school, day care center, creche, *balwadi*
- Caretaker in guest house, hotel rooms, office
- Laboratory attendants in Home Science colleges and schools offering Home Science
- Employee in a dry cleaning shop
- Staff of catering center, dietetics department in hospitals, cafeteria, canteen, food commodity store, etc.
- Employee in a garment manufacturing firm, textile industry, designing unit, etc.

B. Opportunities for self-employment/entrepreneurship

- Producer of household craft items, decorative articles and creative items
- Owner of a nursery school, day care center, creche, *balwadi*
- Owner of a guest house or paying guest accomodation
- Tailor and/or finisher for stitched garments, eg., sewing buttons, doing hemming or attaching a fall on sari etc.
- Owner of boutique, knitted garment unit, weaving unit and fabric enrichment unit
- Owner of dry cleaning shop
- Owner of a canteen
- Supplier of packed meals and food service from home
- Owner of bakery, processed and preserved foods
- Manager of outdoor catering service for parties
- Conducting classes in cooking, garment construction, fabric enrichment, soft toy making, knitting, weaving, etc

- Packaging gift articles, selling fresh and dry flower arrangements, contractual services for decoration for parties
- Writer of articles for children's/ women's magazines

For your knowledge, different types of jobs that are available to Home Scientist after senior secondary have been clearly indicated in Table 1.3. The kind of jobs that are available if you do advanced courses are also clearly mentioned.

INTEXT QUESTIONS 1.3

1. Following are some examples of wage employment in Home Science. In the column given on the right hand side write how you can change each of the wage employment situations to self employment:

Wage employment	Self-employment
a. Employee of nursery school	_____
b. Staff in a government emporium	_____
c. Manager of catering services	_____
d Cook at a canteen	
e. Employee of savings and investment schemes	_____
f. Conducting cookery classes at an institute	_____
g. Working with a supplier of home based food services	_____
h. Caretaker in a guest house	_____
i. Sales person	_____

Which career should I choose?

Table 1.3 Job opportunities in the Area of Home Science

Vocational Areas	Job opportunties after senior secondary	Opportunities of further education	Job opportunities after advanced course
Food and Nutrition	Food Laboratory Aide, Dietary Aide, Food Product Tester, Kitchen Food Assembler, Quality Control Technician, Short Order Cook, Baker helper, Waiter/Waitress, Dining Room Attendant, Cake Decorator	Diploma in Hotel Management and Catering, BSc Home Science, Diploma from Polytechnics/ Vocational Institutions, Diploma in related subjects through Distance Education	Food Technician, Dietary Assistant, Dietetic Technician, Home Economist, Dietitian, Food Technologist, Nutritionist, Caterer, Baker, Food Service Manager, Speciality Cook, Chef
House Keeping	Guest Service Clerk, Housekeeping Maid, Host/Hostess, Establishment Guide, Lodging Facilities Attendant	Diploma in Hotel Management and Catering, BSc Home Science, Diploma from Polytechnics/ Vocational Institutions, Diploma in related subjects through Distance Education	Guest House Manager, Housekeeping Manager, Hospitality Supervisor, Hotel/Motel Manager, Convention Coordinator
Interior Designing, Furnishings and Maintenance	Showroom Assistant, Interior Design Aide, Furnishings Sales Associate	Diploma in Hotel Management and Catering, BSc Home Science, Diploma from Polytechnics/ Vocational Institutions, Diploma in related subjects through Distance Education	Window Display Designer, Interior Design Assistant, Photo Stylist, Furnishings Buyer, Housekeeping Instructor
Consumer Services	Advisor consumer rights, Product Demonstrator, Sales representative, Consumer Reporter, Personal Shopper, Staff of consumer Forum	BA/BSc Home Science, Diploma in Communication and Journalism, Diploma in Public Relations, Diploma in Consumer Protection Law.	Food/Consumer Products Tester, Product Representative, Public Relations Representative, Consumer Newswriter

Which profession should I choose?

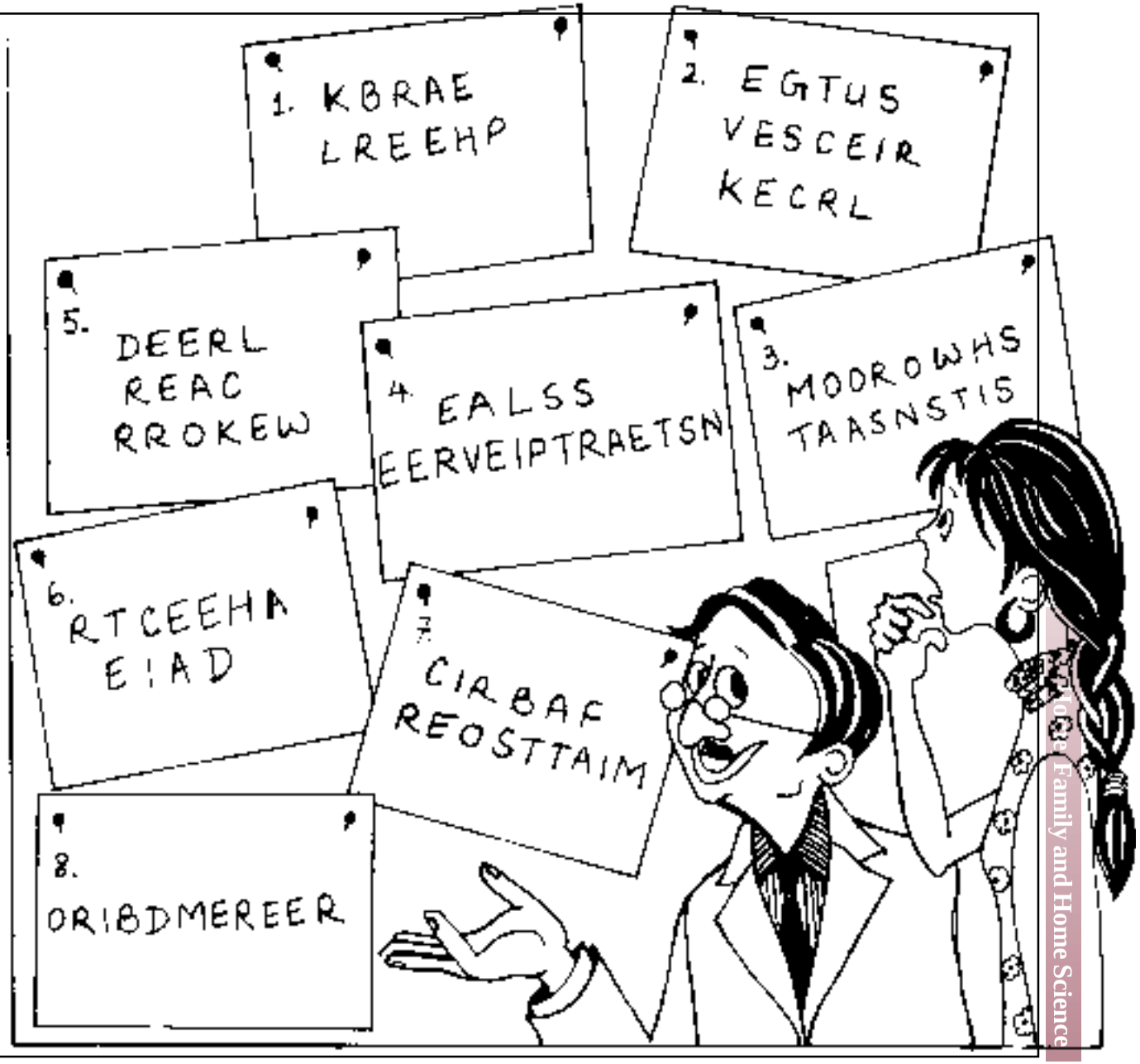
Family and Human Services	Adult Day Care Worker, Residential Care Aide, Elder Care Worker, Family Aide, Personal/Home Care Aide, Homemaker's Aide	BA/BSc Home Science Diploma of Special Educators/ Child Development Counselors	Social Services Technician/ Aide, Community Worker, Special Needs Case Worker
Child Development and Education	Pre-school Aide, Family Child Care Provider, Recreation Aide, Teacher Aide	Diploma of Special Educators/ Child Development Counselors, Child guidance and counseling certificate course, BSc Elementary Education	Child Day Care Supervisor, Pre-school Teacher, Special Education Aide, After-School Program Supervisor
Fashion Design, Manufacturing and Merchandising	Fashion Design Aide, Fabrics/Accessories Estimator, Sales Associate, Costumer Assistant, Employee in a drycleaning shop, Employee in a garment manufacturing firm, Employee in a Textile Industry, Employee in an Embroidery unit	BSc Home Science, Fashion Designing from Institution of Fashion Technology, Polytechnics/ Design Schools	Assistant Designer, Fashion Illustrator, Textile Technician, Computer Imaging Consultant, Merchandise Displayer, Fashion Buyer

*Aide - assistant/helper

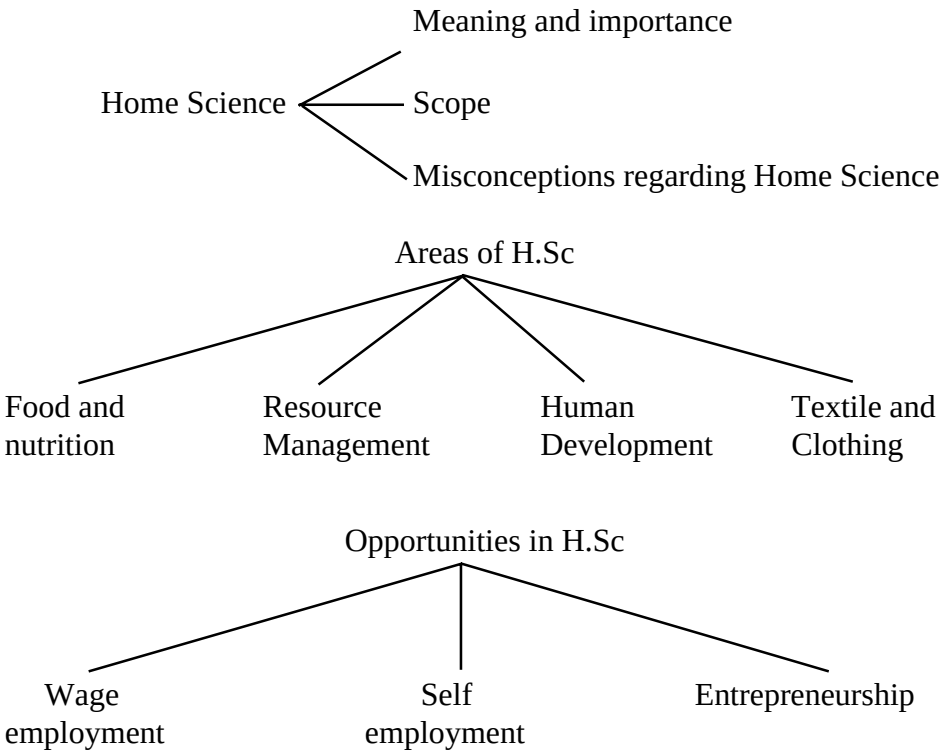
INTEXT QUESTIONS 1.4

1. JOB JUMBLE

Rachna went to the employment agency to look for a new job. But when she got there all the titles had been jumbled up. Mr. Jain the manager, will give Rachna a job if she can unscramble all the job titles. Can you help her?



WHAT YOU HAVE LEARNT



TERMINAL EXERCISE

1. Giving suitable examples, differentiate between the following:
   a) Wage employment and self employment
   b) Home and household
   c) Vocation and entrepreneurship
2. "Home Science is meant for girls only." Comment.
3. Explain the importance of Home Science being studied as a subject by both girls and boys.
4. How will you explain to your neighbour that Home Science is more than studying about cooking, sewing, cleaning and raising childern?
5. Discuss four skills in each area of Home Science that you use in your daily life.
6. Suggest two opportunities each for wage and self employment in each area of Home Science.

ANSWERS TO INTEXT QUESTIONS

1.1 1. a. home, b. homemaker, c. Home Science
d.wage employment, e. entrepreneurship

2. (i) c, (ii) d

1.2 1,2 Refer to text

1.3 1.
a) Opening your own nursery school
b) Owner of a gift shop
c) Starting your own catering service
d) Running your own canteen
e) Agent of saving and investment schemes
f) Starting your own cooking classes
g) Supplying home based food items
h) Running your own guest house
i) Opening your own boutique

1.4 1. Baker Helper
2. Guest Service Clerk
3. Showroom Assistant
4. Sales Representative
5. Elder care worker
6. Teacher Aide
7. Fabric Estimator
8. Emeroi Derer

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3

FAMILY, HEALTH AND SECURITY

The oldest and most common human institution, 'family' is the most important group to which most people ever belong. Each one of us is born into a family – with a father, mother, may be grandparents, uncles, aunts and siblings. Among them we feel protected, wanted and loved. In a family we are cared for and feel emotionally and financially secure. Family teaches us how to interact and get along with others, obey and respect elders. It helps in learning customs and traditions and imbibing values and culture which are passed on from one generation to the next.

In this lesson you will learn more about the functions and types of family and it's role in the health and safety of various members specially children.

OBJECTIVES

After reading this lesson you will be able to :

- define the term 'family' and state its important functions;
- describe the different types of families;
- relate the changing family scenario to the changing roles and responsiblities of family members;
- define the term 'health';
- elaborate the factors contributing to the family health;
- explain the meaning of 'security';
- present different ways of providing a safe and secure home.

3.1 DEFINE THE TERM FAMILY

Family is universal and typically consists of a married man and woman and their children. Family means a group of related people who share a common home.

Members belong to a family through birth, marriage or adoption.

Three characteristics of family emerge from here. These are, a couple is married and hence has legitimate status to sexual relationship between husband and wife. Second, it implies a common place of residence for all its members. Of course, it is seen that sometimes one or more members of a family may temporarily live away from the house for reasons of work or otherwise. Similarly, some members like old and aged parents/uncles/aunts or even cousin may stay with the family and are considered a part of the family.

Thirdly, a family consists of not just the married couple but also children, both natural and adopted. Natural children are those born to the couple and others may be legally adopted by the couple.

Clearly, therefore, the family is the first organized unit of a society. Now let us find out the functions of a family.

Functions of A Family

There are several important functions which a family performs.

(i) It gives **protection:** Indeed, it provides the best setting for the rearing and care of newborns and infants, adolescents, the sick and the infirm or aged.

(ii) It provides **emotional support** of a degree and kind that is not available otherwise. Such bonding is indispensable for the healthy development of children. In fact, the family is the primary group which allows intimacy and affection to be freely expressed.

(iii) It **educates** its members, who learn to live life in the setting of a family. Children are taught the do's and don'ts of the society, how to interact with others, respect and obey elders, etc.

(iv) It provides **financial security**. Basic needs such as of food, shelter, clothing are provided for members and they share responsibilities and work.

(v) It acts as a source of **recreation**. A family can be a source of happiness, where members can talk to one another, play and do various activities together. These may range from house-hold work to celebration of festivals and other events like birth, engagement or marriage.

(vi) Family also performs the function of **socializing** children. Parents give their children the first lessons in how to live with other people, to love, share, help in time of need and take on responsibilities. The family nurtures attitudes and values in children and influences their habits. Traditional skills are also picked up within the family. The family also prepares its young members to get formal education in school and beyond.

(vii) Family also fulfills the **sexual function** which is a biological need of every human being. You know that family implies marriage and all societies approve of sexual relation between man and woman after marriage.

(viii) **Reproductive function** is fulfilled as a result of sexual relationship between married man and woman. Children so born are the future members of the society.

Look at your own family and see whether all of the functions mentioned above are being fulfilled. Your answer will probably be yes.

Let us now see what are the different types of families around us.

3.2 TYPES OF FAMILY

You may have seen that some families are very small and others that are very large. You are right, of course. Two types of families are seen in India-

– Joint Family

– Nuclear Family

A great deal of importance is attached to the family as a unit. In our country, Indian families, generally, are very stable and child-centered. Let us learn about the characteristics of both joint and nuclear families.

Joint Family is made of a combination of nuclear families, and consequently it is much larger. It is made up of a man and his wife, their unmarried daughters, married sons, their wives and children. The men are of the same family and women enter the family by marriage. However, where the woman is the head of the family, it is the mean who enter the family through marriage. It is a group of more than one or even two generations living together.

Fig 3.1 A Joint Family

Typical characteristics of a joint family therefore, are as follows-

i) All member live under the same roof.

ii) Members eat food cooked in a common kitchen.

iii) Members are co-owners of property of the family. The eldest male member of the joint family looks after the finances and the property i.e., there is a common purse.

iv) Members participate in common family events, festivals and religious ceremonies.

v) Daughters of the family get married and move out to their husband's house while sons remain in the house with their wives and children.

vi) The decision making power in a joint family is with eldest adult male member. The eldest woman also plays a role in decision making but in a subtle way.

Traditionally, joint families used to be the rule in our society. Things are changing now especially in urban areas. However, the joint family system still continues in agricultural and business families.

There are several **advantages of a joint family:**

- It encourages family members to be co-operative and accommodating. Work, especially agricultural work, can be shared.
- It allows for the old, the helpless and the unemployed in the family to be looked after and cared for.
- Rearing of small children becomes easier, especially when both parents work.
- A child gets emotional and economic support in the event of the death of a parent.
- There is greater financial security.

Joint families also have their problems.

- Women are sometimes badly and unequally treated.
- Often disputes arise among the members over property or the running of a business.
- Some of the women have to do all the housework, and they get very little time or opportunity to develop their personality.

The Nuclear family is usually a small unit made up of the husband, the wife and their unmarried children. Sometimes a brother or unmarried sister of the husband may be living with them. This would be an **extended family.**

Fig 3.2 A Nuclear Family

There are some **advantages of living in a nuclear family:**

- Members of a nuclear family are generally more independent and show greater initiative and self-reliance.

- The children are frequently encouraged to make decisions. This increases their self-confidence.
- Deeper emotional ties develop among the members. This is on account of the greater privacy and also opportunities for mutual interaction which are available in a nuclear family.
- It is seen that as a society becomes more industrialised and urbanized, the incidence of nuclear families increases.
- One of the foremost reasons for families to be nuclear, especially in big cities is housing problem. Larger families need larger space to live in. If families have to live conveniently there is little option but to stick to a "nuclear" family.

Disadvantages of a Nuclear Family

- There is no adult support to the young couple. No experienced person of the family is readily available for advice.
- When both the parents are working no one from the family is there to take care of children.
- In case of adversity there is no one to support the family financially or emotionally.
- Social values like 'adjustment', sharing or cooperation are difficult to learn.

INTEXT QUESTIONS 3.1

1. Pick the correct alternatives. Give reasons for your selection.

   i) In a joint family the purse is

   (a) common for the whole family

   (b) with every head of small unit

   (c) with every female head of small unit

   (d) with both male and female heads

   .....

   .....

   .....

   (ii) In a joint family all the decisions are made by

   (a) only male head of the family

   (b) only female head of the family

   (c) both male and female head of the family

   (d) all members of the family

.....

.....

.....

(iii) In a joint family property is owned by

(a) only male head of the family

(b) only female head of the family

(c) both male and female head of the family

(d) all members of the family

.....

.....

.....

2. List two characteristics which children living in joint family develop and two characterstics which children living in nuclear family develop.

i) Joint

a) .....

b) .....

ii) Nuclear

a) .....

b) .....

3.3 CHANGING FAMILY SCENARIO

As we have said earlier, industrialization has brought about many changes in the type of family and as a result, in the roles and responsibilities of members of a family. So far, in a traditional family, the sons 'took on' the family business or profession. The father or male members used to earn the money and were responsible for the 'outside' work. The women looked after the home and the children.

Now children, boy or girl, are more educated and have greater and better opportunity for jobs. They leave their home to work elsewhere, most often to urban areas from rural areas and suburbs. This has resulted in more nuclear families. Because of smaller families, requirements of the family have changed, for example ration requirements are less and also different because the number of people at home are less.

Being on their own, women have a greater responsibility of looking after the home and outside work. Similarly, the men also have to help out at homes looking after

the children, etc. In some cases women have taken up jobs outside the house and have the added responsibility of earning and looking after the home and children.

The children too have to be more self-reliant and have to do their share of work at home.

Family life was earlier rigidly patriarchal, where children and wives had few rights and privileges and were not free to voice an opinion. It is now undergoing a change. In the modern home women have greater freedom and social importance. The children too have rights of their own. Their interests and desires have to be considered. They also are able to voice their opinion on family matters which concern them. Duties, which are divided in a joint family because of presence of grand parents, uncles, aunts and siblings become concentrated with the parents.

As the nuclear family is far away from the rest of the family and relatives, the larger community of neighbours, colleagues, friends etc. become important. The family members need to adjust and adapt to them harmoniously.

Activity: Look around and observe the type of families in your neighbourhood. Observe the members in any two families. Record the following information.

- Who is the head of the family
- Who controls the finances
- Are both partners working
- Who is the decision maker
- Who mostly does household chores
- Who does the shopping
- Who takes care of children

3.4 CONCEPT OF "HEALTH"

Can you define 'Health'? Well you are right. Health is the state of being free from disease. But, this is not a complete definition of health. According to the World Health Organisation: **"Health is a state of complete physical, mental and social well-being and not merely an absence of disease."**

What does this mean? It means that health includes being physically fit, mentally relaxed, happy and free from worries and socially one is able to get along with people, have confidence in dealings with other people in society, help others and is sensitive to their needs.

Can you now list the indicators of good health? Yes, you are right. These are as follows:

Good health

Physical	Mental	Social
- energetic	- happy	- get along well with others
- good posture	- contented	- pleasant mannerism
- normal weight and height	- confident	- help others
- body organs functioning normally	- sensitive to other people's needs.	- fulfil responsibility towards others
- clear, clean skin	- free from tensions and anxieties	
- bright eyes	- relaxed	
- shining hair		
- clean breath		
- good appetite		
- good sleep		

INTEXT QUESTIONS 3.2

1. Define health in your own words.

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.....

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2. List ten characteristics of good physical health.

.....

.....

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.....

.....

3. List five characteristics each of mental and social health.

.....

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.....

.....

Factors contributing to health of the family

A family includes the young and old, men and women, each with different needs and health requirements. Let us discuss requirements for good health of a family here.

1) Nutritious Food

Why do we need food? We need to eat so that we get energy, build muscles and bones and protect our body from disease. We must eat a balanced diet, which means our food must have carbohydrates, proteins, fats, vitamins and minerals in the right quantity. The 'right quantity' depends on the age, sex, work of a person, status of health etc. A growing child needs more protein, an adult needs more carbohydrate, sick people need different types of food depending on the disease. A person with diabetes should not be given sweets. Food eaten at the proper time is a healthy habit. We should avoid eating in between meals. Children should be encouraged to eat fruits and vegetables and less of fried and 'fast' food like hamburgers and pizzas. Consumption of sweets, chocolates and 'cola' drinks should be minimal.

2) Personal Hygiene

There are four major aspects of personal hygiene:

(i) Cleanliness

(ii) Physical exercise

(iii) Rest and sleep

(iv) Healthy habits

Let us study more about these aspects.

i) Cleanliness

Hands: These must be cleaned regularly. We are continually handling a variety of things like furniture, books, coins, currency notes, animals etc. All these carry germs which may be picked up by your hand and fingers and transferred over other parts of the body or into your mouth through food. To avoid getting any infection through these modes remember the following:

- Never put your fingers into your mouth.
- Never turn the page of your book or newspaper by applying saliva to your finger and likewise never count the currency notes in a similar manner.
- Any time holding the currency notes or other objects in between the lips is even more risky as you may catch germs.
- After using toilets (latrines) always wash your hands very well with soap or with clean charcoal ash but never with any soil *(mitti)*.

- Indian culture of washing hands before and after meals is certainly a hygienic practice, which must never be forgotten.
- Shaking hands, though very common, is a potential source of transmission of germs.

Skin: In order to keep the skin healthy take a bath daily because regular bathing does the following:

- Keeps the skin clean and free of germs
- Removes the body odours given out in perspiration
- Keeps the sweat pores open

Also, change undergarments daily and wash them daily. Use handkerchief/ disposable napkins for nose.

Hair: The hair should be kept clean by frequent washing and regular combing. This keeps them healthy and free of parasites (like the head lice) and dandruff. Applying oil to the hair in moderate quantities at frequent intervals is required.

Teeth: The teeth should be cleaned at least twice a day, i.e., before going to bed, at night and after getting up in the morning. The mouth should be washed after every meal. This removes most of the extra food particles stuck in between the teeth. Too many sweets and chocolates is harmful to both your teeth and gums. When teeth and gums are not clean and healthy one is likely to get bad breath.

Breathing by nose: Always breathe by nose and never by mouth. Your nose filters out the dirt and germs from the in-going air, thus protecting you from many diseases.

Eyes: The eyes must be cleaned and washed with clear water two or three times every day. Otherwise sticky white/yellow dirt sticks on inner sides of the eyes. Never share towels with others, even in the same family. Applying kajal may some times lead to eye infections specially if the same applying stick is shared by others.

Ears: The ears should be kept clean. If you do not wash ears every day you can see dirt depositing on the insides of the ears. The wax inside may be cleaned by a soft moistened swab (phurari). Never put pointed object into your ears.

Nails: Nature has provided nails for efficient working of fingers in holding and manipulating objects. These are also an item of personal beauty. But long or untrimmed nails gather dirt and germs underneath. So, always keep your nails trimmed and clean.

INTEXT QUESTIONS 3.3

Mention two important indicators each for the following :

S.No	*Part of body*	*Indicators*
1.	Hands	
2.	Skin	
3.	Hair	
4.	Eyes	
5.	Nails	
6.	Nose	
7.	Ears	

3. Physical Exercise

Some kind of physical exercise is necessary for all age groups. Children, adolescents and the young specially need it. Physical exercise improves blood circulation. As a result, all the organs of the body receive the required oxygen and nourishment for normal healthy growth.

There are a variety of physical exercises to suit you:

- Brisk walking, running or jogging, aerobics, yoga, etc.
- Playing fast games like kabaddi, kho-kho, football, hockey and other such sports
- Wrestling, dund-baithak, judo, karate, etc.

Fig 3.3 Exercise

For older people long gentle walks and yogasanas are excellent for keeping fit.

4. Posture

Fig 3.4 Good Posture

Correct posture is also important for health as well as for impressive personality. You know that posture means the manner in which one sits, walks, stands and works. You must learn to sit, stand and walk with your back straight and shoulders stretched.

5. Rest and Sleep

During the day you work a lot and your body muscles get tired. Similarly, your brain too gets tired because you read and memorize and do so many other things mentally. Resting for a short while after intense work and sleep at night

Fig 3.5 Rest is essential

refreshes your body for more work the next day. Sleep provides a good rest not only to the tired brain but also to the fatigued body muscles.

How much to sleep?

- Very young infants sleep for most of the day.
- For the adults 6-7 hours of continuous sleep is sufficient.

  The room or the place where you sleep should be well ventilated to allow fresh air to come in, also it should be free of noise and disturbance.

6. Healthy Habits

You should develop good habits. Some important ones are as follows:

- Take your food at regular hours
- Go to bed at regular timings
- Clear your bowels (passing stools) every day, preferably in the mornings.
- Say 'no' to any temptation of even just trying once to taste drugs (stimulants and sedatives). Similarly, don't smoke or chew tobacco or even eat pan masala and keep away from alcoholic drinks.
- Never spit, urinate or defecate on the roadside or in public. Use only public latrines and that too carefully, without making them dirty.

7. Sanitation - Keeping the Surroundings Clean

Sanitation means not to allow our surroundings to become dirty. What are the things that can make your surroundings dirty?

(i) From your homes

- Kitchen waste, peel of vegetables and fruits
- Occasionally, the discarded stale food
- Water after washings of utensils
- Outflowing bathroom water
- Human excreta, though normally flushed into sewers if provided, or into the soak pits, or in very rare cases disposed off manually in dry latrines.
- Sometimes, deliberately killed dead rats, cockroaches, etc.
- Some waste paper, waste packing bags and tins.
- Sometimes plant wastes if there happens to be any kitchen garden or flower beds.

(ii) Garbage outside-on roads and streets

- Leaves fallen off from roadside trees and bird droppings

- Animals excreta. Stray animals such as cows, buffaloes and street dogs pass out faeces and urine. At times even the owners of pet dogs take them out and let them ease at public places.
- Occassionally dead animals like cats dogs or cattle may just be left in the open to rot for some days.
- Sometimes deliberately thrown out domestic waste articles.

(iii) Garbage inside your schools

Almost all the things as listed above under homes can be found in a school also. There may even be kitchen refuse if there happens to be a canteen or a refreshment stall in the school.

What happens if your surroundings are dirty?

If your surroundings are dirty, having rotten things, choked drains and accumulated dirty and stinking water, it presents an ugly look. Besides, these are the breeding places for insects and a whole lot of disease-producing germs grow there. People living or working in such conditions often suffer from a variety of diseases such as cholera, jaundice, malaria and tuberculosis.

iv) Climate and Clothing: Wearing clothes according to season is also important to maintain good health. You know clothes protect you from extreme heat and cold. Besides, clothes must be clean or else will cause problems of skin. Wear cottons in summer. It keeps the skin comfortable because it absorbs perspiration and dries up quickly to keep the body cool and dry. Wool keeps you warm and protects you from cold during winters.

Fig 3.6 Aporopriate Clothing

INTEXT QUESTIONS 3.4

Mention two reasons each for

(i) Regular exercise _____

_____

(ii) Good posture _____

_____

(iii) Rest and sleep _____

_____

(iv) Healthy habits _____

(v) Clothing to suit climate. _____

_____

_____

3.5 CONCEPT OF "SECURITY"

Security means safety to life. It can be physical and psychological or mental.

You know that **physical security** is safety of the body and its processes. It has a direct bearing on health. When air around you is polluted or the water you drink or the food that you eat is infected with germs you can fall sick. If the floor is slippery or when the roof top is unprotected you can fall and hurt yourself. The electric wiring, the gadgets, the plug points, the sharp tools and the fire in the kitchen, the broken glass/glass panes, etc., that you use or come in contact with can be a source of injury to your body. For protecting your body you have to make sure that your house/school, is a safe place to live and work and you yourself follow the rules of safety. Not only that, you also make others follow rules of safety.

Psychological/mental security is about how you feel about yourself and everybody around you. It depends on how you have been brought up.

Parents try to bring up children with loving care. They only socialize them i.e., teach them about family, relationships, rituals and rules of the society. They also inculcate in them the values and ethics of living with others and disciplining self. When children grow up in such an environment they are emotionally stable and contented. They become socially mature enough to get along with everybody around them. They respect all and have a positive image of self. They are ready to face any eventuality – success or failure. When they fail they know that their families are behind them.

These days in many urban homes with nuclear families, both parents are working. Children in these homes come back to empty house and fend for themselves for at least three to four hours. Contact between parents/adults and children is important and this can be through telephone and/or a good neighbour. Otherwise children can indulge in mischief or go astray.

When parents are home, both working or non-working mothers, need to spend some quality time with their children. During this time they can listen to their child's narration of what happened during the day, if they have attended to their homework, if they need anything for next day or need to prepare for a test etc. They can also share with them about their own interesting experiences and happenings. This whole exercise is to bring the children and parents close to each other, to give children a feeling that parents feel concerned, love and support them in any situation. Needless to say, all this is an investment by parents to raise mentally secure children.

3.6 SAFETY FROM CHILD ABUSE

Child abuse can be physical, sexual or mental. In any form it is forbidden and against the safety of the child. Physical abuse is when adults beat the child or punish by locking in a room, making the child sit in a particular position for long hours. Sexual abuse means involving or forcing children into forbidden sexual activities. Mental abuse on the other hand is giving mental torture to the child. Calling a child good for nothing, emotionally blackmailing, socially boycotting the child and so on are forms of mental abuse. Children should have protection from all these.

3.7 SAFETY FROM SMOKING, ALCOHOL AND DRUGS

Smoking, drinking alcohol and taking drugs generally start with peer pressure and for the sake of fun. But one soon gets into a habit of taking these and then there is no return.

When anyone smokes, one inhales carbon monoxide and nicotine, both harmful for the respiratory system leading to cancer of mouth and lung. Consumption of alcohol leads to hardening of arteries leading to a heart attack.

Drugs may be beneficial when administered under a doctor's supervision. They are stopped as soon as treatment is over. But the continued use of drugs like cocaine, morphine etc., produce addiction which in the long run can be fatal.

Breaking the habit of smoking and taking alcohol and drugs is very difficult but can be done under supervision and with a lot of support from concerned family member.

3.8 HOME AND SAFETY

Many accidents happen to people in their homes. People can hurt themselves by falling over or by burning themselves. Children may drink some of the poisonous things that we keep in the house such as insecticides or acids.

One of the most serious dangers is from fire. A room may catch fire because of a heater that tips over or malfunctions. Some very serious house fires start with a cigarette. Electrical wiring that is not properly done can also cause fires. It can also give you an electric shock.

Fig. 3.7 Source of accidents

Activity

1. Here are some pictures of dangers in the home. Use each picture to help you write a sentence of good advice. One has been done for you. Do the rest yourself.

Turn saucepan handles so that they cannot be knocked over.

.....
.....
.....

.....
.....
.....

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.....
.....

2. Compare the sentences that you have written with a partner. Work out four more sentences of good advice for safety in the home.

3. Write a note on the safety measures observed at your home, keeping the following points in mind.

   i) Kitchen
   - How safe is the cooking range/chullah
   - Gadgets you have, their condition and safety in use.
   - Sharp tools – condition and safety in use
   - Floor

   ii) Bathroom
   - Floor – for safety from falls.
   - Any other fixture if it comes in the way and can hurt

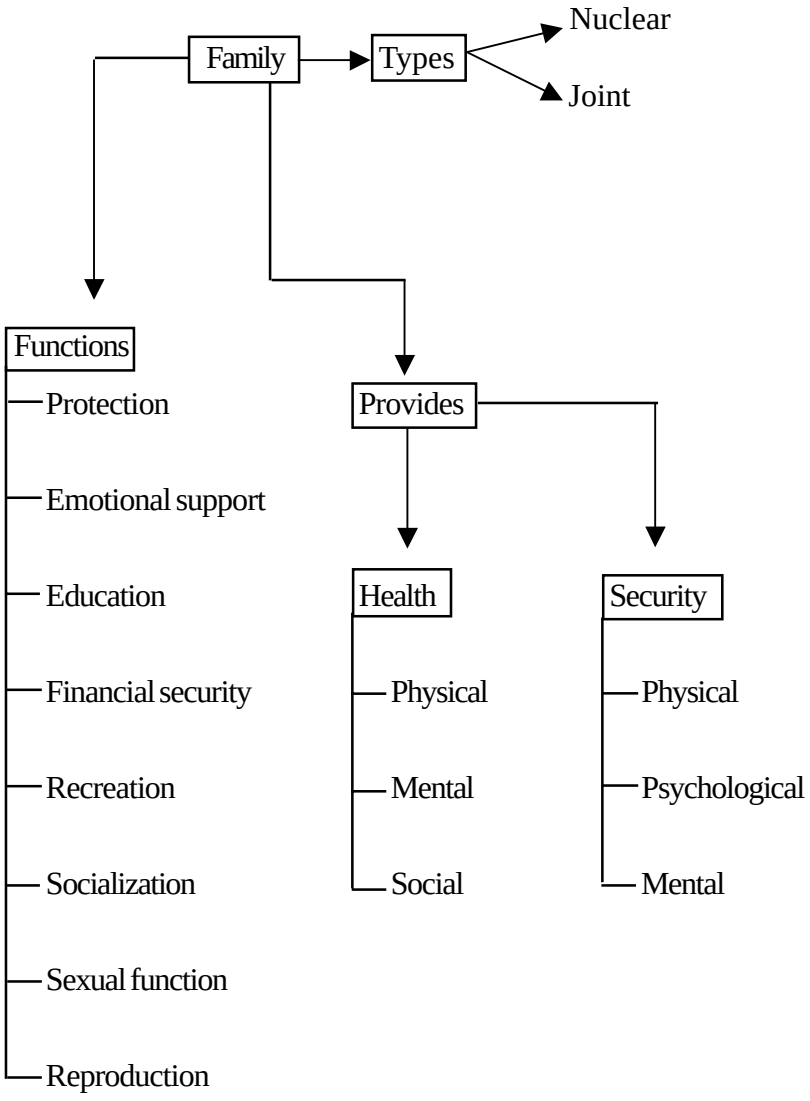
iii) Windows and glasspanes.

– If these can be conveniently closed and opened

– Any broken glasspanes that can hurt.

4. List some safety hazards at your home. What can you do to change unsafe conditions at your home?

WHAT YOU HAVE LEARNT



TERMINAL EXERCISE

1. Define 'security'. State its two types.
2. Observe the following in your family and write a short note on their contribution in promoting mental security.
   - i) Members in the family
   - ii) Working members
   - iii) Closeness among members
   - iv) Division of labour among members
   - v) Any recent instance when one member has done something for the other.

ANSWERS TO INTEXT QUESTIONS

3.1 1. i) a ii) a iii) d

2. i) a) sharing, b) emotional bonding with all

   ii) a) independence, b) decision making

3.2 1, 2, 3, → Refer to text

3.3 Refer to text

3.4 Refer to text

For more information log on to
http://www.bccf.bc.ca/learn/wl_workfam.html

Notes

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4

FOOD, NUTRITION AND HEALTH

The term 'food' brings to our mind countless images. We think of items not only that we eat and drink but also how we eat them and the places and people with whom we eat and drink. Food plays an important role in our lives and is closely associated with our existence. It is probably one of the most important needs of our lives.

The food that we eat is composed of small units that provide nourishment to the body. These are required in varying amounts in different parts of the body for performing specific functions. This means that good nutrition is essential for good health. However, if our diet provides the important units in incorrect amounts, either very less or in excess of what is required, it results in an imbalance of nutrients in your body. The condition is responsible for various deficiency diseases and slow or no growth of the body.

In this lesson you will learn about why **food** is essential, its functions and components. You will also be introduced to the terms like **'nutrition'** and **'nutrients'**. After learning the meaning of these terms, you will then learn the sources and functions of the nutrients and the amounts required by different individuals.

OBJECTIVES

After reading this lesson, you will be able to:

- explain the functions of food;
- enumerate the sources and functions of the nutrients;
- relate the nutritional requirements in terms of Recommended Dietary Allowances (RDAs) to nutrition and health.

4.1 WHAT IS FOOD?

The term 'food' refers to anything that we eat and which nourishes the body. It includes solids, semi-solids and liquids. Thus, two important features for any item to be called food are:

(i) It should be worth eating, that is, it should be 'edible'.

(ii) It must nourish the body.

Have you ever wondered why food is considered a basic necessity?

Food is anything that we eat and which nurishes our body. It is essential because it contains substances which perform important functions in our body.

4.2 FUNCTIONS OF FOOD

There are basically **three** important functions of food:

1. Social Function

Food and eating have significant social meaning. Sharing food with any other person implies social acceptance. Food is also an integral part of festivity every where in the world. Have you noticed that certain occasions such as birth of a child or a marriage or birthdays, are celebrated by having feasts and serving delicacies? Food also has a specific significance and meaning in the religious context.

2. Psychological Function

We all have emotional needs, such as need for security, love and affection. Food is one way through which these needs are satisfied. For example, how do you feel when your mother prepares your favourite food or dish? You feel that she loves you and cares for you. Food is often served as a reward also. Do you recall giving a chocolate because some one had been good to you? Similarly, certain foods become associated with sickness, such as khichri and bland foods. Sickness is an unpleasant experience, hence, even the food items served during this state may be associated with unpleasant feelings.

3. Physiological Function

There are three physiological functions performed by food. These are

energy giving, body building, regulating body processes and providing protection against diseases. Let us see them in detail.

(i) Food provides energy

Everybody needs energy to do work. Energy is required for walking, studying, eating, working in the house or outside. You get this energy from the food that you eat. You need energy even when you are resting. Can you tell why? Different organs inside your body are always working, for example, heart is pumping blood, stomach is digesting food, lungs are breathing in air, etc. All these organs need energy for their respective functions and food provides that energy.

(ii) Food helps in body building

Have you ever wondered how a small child grows into an adult? Our body is already made up of thousands of small cells. New cells are added to these to help the body to grow. Food is needed for the formation of new cells. Cells also die or are damaged due to injury. New cells need to be formed and this repair work is done with the help of food.

(iii) Food regulates body processes and provides protection against diseases

Regulatory functions refer to the role of food in controlling body processes, for example, our body temperature is maintained at 98.6^0F or 37^0C. Similarly, the heart beats are also maintained at 72 beats/minute. Excretion of waste products from the body is also regular. If not, the body suffers from a disease called constipation which can lead to further complications. All these processes are regulated by the food that you eat.

The food that we eat gives us strength to fight against disease germs.

Look at the illustration 4.1 to learn about the functions of food.

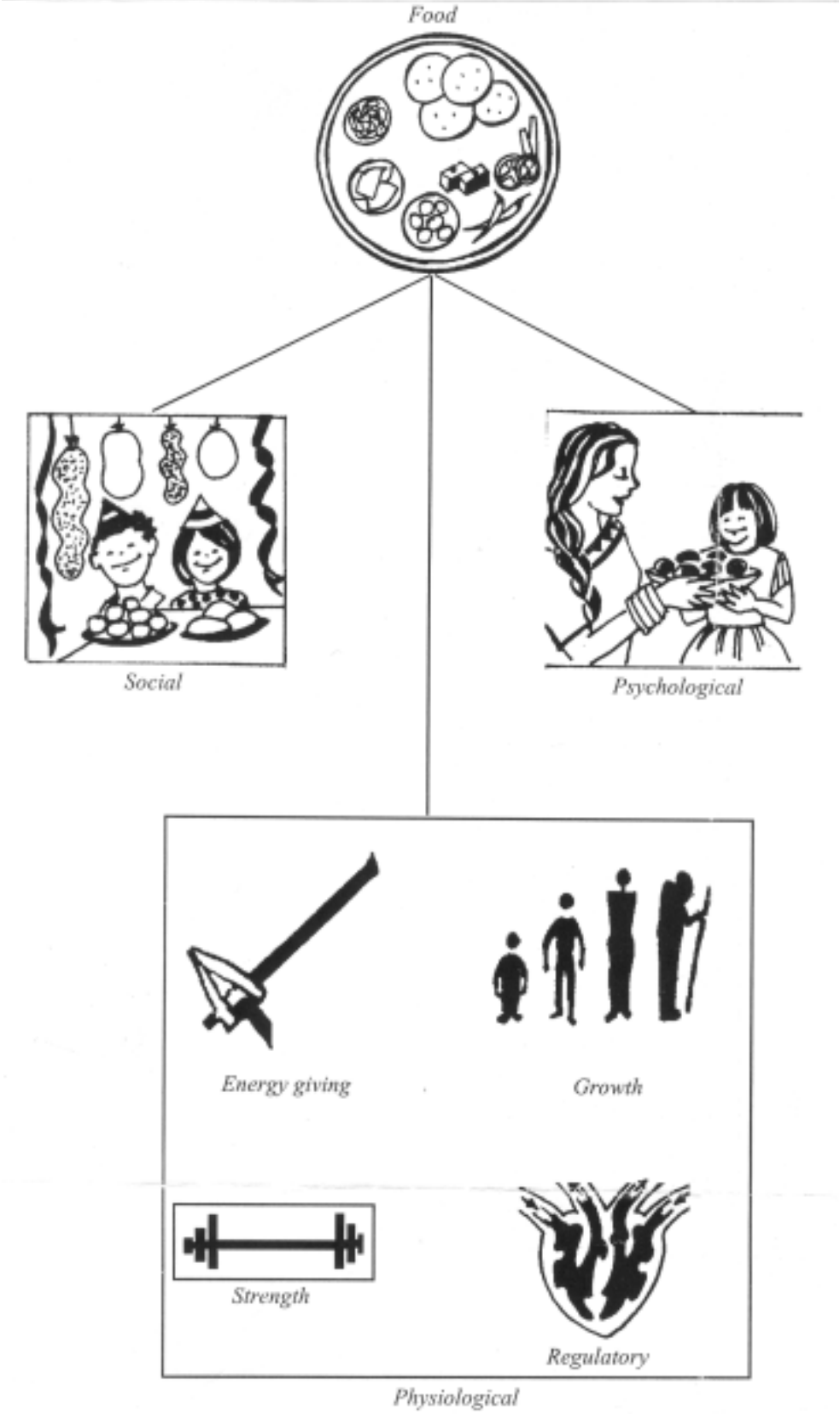


Fig. 4.1 : Functions of food

INTEXT QUESTIONS 4.1

1. Define food.

   .....

2. List the three functions of food.

   .....

   .....

   .....

3. Give one example (other than those given in text) of each function of food.

   .....

   .....

   .....

4.3 NUTRITION AND NUTRIENTS

Let us now read about the meaning of nutrition. All of us eat food. Food provides nourishment to the body and enables it to stay fit and healthy. The food that we eat undergoes many processes, like, first the food is digested, then it is absorbed into blood and transported to various parts of the body where it is utilized. The waste products and undigested food are excreted from the body.

NUTRITION is the process by which food is taken in and utilized by the body.

NUTRITION = Eating → Digestion → Absorption → Transportation → Utilization

Nutrients and their Functions

We all know that food helps in the nourishment and health of our body. The nourishment is brought about by small units called nutrients present in food. Now what are these nutrients?

Nutrients are the chemical substances present in food and are responsible for nourishing the body.

Nutrients are of two types:

1. **Macronutrients**
2. **Micronutrients**

Both macronutrients and the micronutrients are equally essential for good health. Each nutrient plays a significant role in the body.

1. Macronutrients

These are present in large quantities in foods and are also required in large amounts by the body.

Carbohydrates, proteins, fats and oils are macronutrients.

A. Carbohydrates

(i) Available carbohydrates

Carbohydrates are present in a large quantity as *starch* in cereals, legumes, pulses and potatoes. They are present as *simple* carbohydrates in sugar, jaggery, fruits, honey and milk.

Starch and sugars are easily digested and provide energy to the body.

(ii) Unavailable carbohydrates or dietary fibre

They are present in the form of cellulose and hemicellulose which are not digested in our body. They add bulk to the stool and help in easy defecation process.

Energy can be derived from carbohydrates, fats and proteins and it is measured in kilo calories. However, carbohydrates are cheapest sources of energy. If there is a short supply of carbohydrates and fats in our body, proteins are utilized for energy production. Function of proteins is to provide for body building. Therefore, carbohydrates have to be consumed in proper amounts to spare proteins for body building purpose.

Functions of carbohydrates are summarized here:-

- Carbohydrates provide ***energy***
- Carbohydrates are the ***main source*** of energy
- Carbohydrates ***spare proteins*** for body building function
- Dietary fibre increases the bulk in stool and ***helps in defecation***

1 gm of carbohydrate gives 4kcal of energy. Kilocalorie is the measure of energy in food.

Food sources of carbohydrates are:

- Cereals - wheat, rice, bajra, maize, etc.
- Pulses - Rajma, channa, all dals
- Roots and tubers - potatoes, sweet potatoes, beetroot and tapioca
- Sugar, jaggery

B. Proteins

Protein are needed in the body for body building.

1 gm of protein gives 4kcal of energy

Proteins are made up of smaller units known as amino acids. There are all together 22 amino acids, out of which there are 8 amino acids which our

body cannot manufacture. Rest of the amino acids can be manufactured by the body.

Essential amino acids are those which our body cannot manufacture and hence have to be supplied through the diet.

Non essential amino acids are those amino acids which our body can manufacture.

Functions and sources of proteins

Functions

(i) Needed for growth, maintenance and repair of tissues.

(ii) Necessary for production of enzymes, hormones, antibodies, haemoglobin, etc.

(iii) Help in the clotting of blood

(iv) Provide energy, if necessary

Sources

- Meat, poultry, fish, eggs
- Milk, cheese, paneer, curd
- soybeans, peas, pulses,
- cereals, nuts and oilseeds like til, groundnuts, etc.

Special features

(i) Animal proteins, i.e., proteins from meat, eggs, milk, etc., are better than vegetable proteins, i.e., proteins, from pulses, cereals, etc. This is because proteins from vegetable sources do not contain all essential amino acids.

(ii) Including two or more sources of vegetable proteins in each meal helps to improve the quality of proteins and their utilization.

Note: When the body does not get enough carbohydrates or fats to meet its energy needs, proteins are broken down to supply these calories. When proteins are used for energy they are not available for other vital functions.

Activity 4.1: List five dishes that you can prepare at home by mixing proteins from two different sources. Example - Khichri

S.No.	*Name of dish*	*Protein sources*
1.		
2.		
3.		
4.		
5.		

C. Fats and Oils

Fats and oils are the concentrated source of energy in our diet. **1 gm of fat gives 9 kcal of energy.** Fats are made up of small units called fatty acids. The nature of fats is dependent on the type of fatty acids present. Fatty acids may be saturated or unsaturated. Saturated fatty acids are found in solid fats whereas oils contain more of unsaturated fatty acids. Vegetable oils are rich in unsaturated fatty acids. Do you know there is a difference between fats and oils?

If a substance is liquid at room temperature it is called **oil** and if it is solid at the room temperature, it is known as **fat**.

Activity 4.2: List down five fats and oils that are used in your home.

1. .....
2. .....
3. .....
4. .....
5. .....

Functions and sources of fats and oils

Functions

(i) Provide concentrated source of energy

(ii) Reduce the use of proteins for energy

(iii) Carry fat soluble vitamins (A, D, E, K) into the body and help in the absorption of these vitamins

(iv) Help to maintain body temperature. The layer of fat under the skin helps to conserve body heat

(v) Act as a cushion to certain vital organs

(vi) Help in growth of tissues

Sources

- Cooking oils, ghee, butter
- Oilseeds, nuts
- Meat, poultry, fish, eggs
- Whole milk, cheese

Special features

(i) Fats improve the texture as well as absorb and retain flavours making meals more appetizing.

(ii) Fats have properties that help them to remain in the stomach longer and prolong the feeling of fullness.

INTEXT QUESTIONS 4.2

1. Answer the following questions

   (a) What is nutrition?

   .....

   .....

   (b) List the main functions of nutrients.

   .....

   .....

   (c) Give at least 2 examples of the following foods-

   (i) Food rich in proteins.....

   (ii) Food rich in carbohydrate.....

2. Indicate whether true or false. Give reasons for your answer.

   (a) The energy giving function is the major function of protein.

   .....

   .....

   (b) Dietary fibre is the unavailable carbohydrate.

   .....

   .....

   (c) Combination of cereals and pulses in a meal improves the quality of protein.

   .....

   .....

   (d) Fats are liquid at room temperature.

   .....

   .....

2. Micronutrients

Other important nutrients which are present in small quantities in foods but are essential for our body are called micronutrients. These are **minerals** and **vitamins** and are required in very small quantities. If these micronutrients are not eaten in required amounts, it results in deficiency diseases.

Minerals and vitamins are called micronutrients

Let us study some of the important micronutrients.

1. Vitamins

Our body contains very little quantity of vitamins, however, you will be surprised to know that they are responsible for all the major functions of the body. These vitamins are of two types:

(i) Fat soluble: A,D,E and K

(ii) Water soluble: B and C

Now, let us study the functions, food sources and deficiency diseases of these vitamins as given in table 4.1 and 4.2.

Table 4.1
Fat Soluble Vitamins: Functions and Sources

Nutrients		Functions		Sources
Vitamin A	(i)	Essential for proper functioning of eyes, that is, vision in dim light	-	Liver, eggs, fish liver oils.
			-	Milk and its products
			-	Green leafy vegetables, i.e., bathua, etc.
	(ii)	Necessary for healthy skin and linings of nose, mouth, throat, eyes, ears, lungs and other organs	-	Yellow or orange fruits and vegetables such as pumpkin, carrot, papaya, mango, etc.
Vitamin D	(i)	Necessary for formation and maintenance of strong, healthy teeth and bones	-	Exposure of skin to sunlight (When the body is exposed to the sun rays, a substance in the skin is converted into vitamin D and transferred to the blood stream)
	(ii)	Helps in the proper absorption and utilization of calcium and phosphorus in the body	-	Eggs, liver, fish liver oils
			-	Milk, butter
			-	Refined oils and ghee fortified with vitamin D
Vitamin E	(i)	Prevents destruction of certain substance in presence of oxygen	-	All cereals, pulses, vegetables oils
Vitamin K	(i)	Necessary for clotting of blood	-	Formed in the intestines by bacteria normally present there
			-	Green leafy vegetables
			-	Egg, liver

Table 4.2
Water Soluble Vitamins: Functions and Sources

Nutrients	Functions	Sources
Vitamin B complex There are eight B vitamins. Together they are called vitamin B-complex. These are: thiamine B_1 Riboflavin B_2 niacin etc.	(i) Necessary for utilization of carbohydrates in the body (ii) Necessary for normal functioning of nervous system (iii) Essential for proper growth (iv) Helps body organs to function normally (v) Needed for formation of red blood cells (vi) Helps in digestion and improves appetite.	– Liver, poultry, meat, fish, eggs; – Whole grain cereals and pulses – Green leafy vegetables and milk
Vitamin C	(i) Necessary for the formation of the sub-stance that holds cells together (ii) Needed for strong teeth and bones (iii) Helps in the production of haemoglobin (iv) Helps in the utilization of other nutrients in the body (v) Helps in fighting the germs causing diseases	Citrus fruits like amla, orange, lemon, guava, etc; Green leafy vegetables, e.g. spinach, cabbage; Sprouted pulses such as grams

INTEXT QUESTIONS 4.3

1. Classify the vitamins A,B,C,D,E and K as:

   Water soluble vitamins.....

   Fat soluble vitamins.....

2. State whether the following statements are 'True' or 'False', correcting the statement where ever necessary.

   (i) Vitamin C is produced when the body is exposed to sunlight.

   .....

   (ii) Vitamin A helps to keep our eyes healthy.

   .....

   (iii) Vitamin K plays a role in our feeling hungry.

   .....

(iv) Vitamin E is necessary for clotting of blood.

.....

(v) Vitamin A and B are necessary for strong and healthy teeth and bones.

.....

2. Minerals

Minerals constitute a very small amount of the total body tissues. However, these are essential for many vital processes and also for the maintenance of the body. In total, there are about 19 minerals required by the body in various amounts.

Let us now study some of the important minerals.

Calcium: Calcium and phosphorus are available in sufficient quantities in milk, curd, green leafy vegetables, ragi and oil seeds. Other foods also provide fair quantity of calcium.

The major function of calcium is the formation and development of bones and teeth. Calcium is also required in blood clotting and muscular contraction.

> ***Calcium is necessary for bone formation, blood clotting and muscular contraction***

Deficiency of calcium in the body results in poor bone development, particularly in children, women and elderly. The deficiency disease is known as ***osteoporosis***. In this, the bones becomes brittle and people become prone to frequent fractures.

Iron: Iron is required in very small quantity by the body. It is an important material present in haemoglobin which is a part of red blood cells and is responsible for the red colour of blood. Whole grain cereals and pulses are the major sources of iron in our diet. Other sources of iron are green leafy vegetables, egg yolk, liver and meat. In our country, majority of the population, especially women and children, suffer from iron deficiency disease called ***anaemia.***

Young girls (12-18 yrs.) need move iron rich foods in their diets because of loss of iron during the menstrual cycle. Extra iron is also needed during pregnancy for healthy development and growth of the focus. (Refer to Table 4.3)

This is not because people do not consume food which are rich in iron but because the absorption and utilization of iron is poor. This is due to the presence of certain naturally occuring constituents in food called oxalates and phytates. These oxalates and phytates are called *inhibitors* of iron. Vitamin C and proteins help in better absorption of iron and are known as *enhancers of iron.*

Iron is essential for haemoglobin formation.

Iodine: Iodine is an important substance present in thyroxine hormone produced from thyroid gland. Thyroxine regulates various functions of the body. We get iodine from water and food. The foods which grow in iodine rich soil provide iodine for us. Sea foods are also rich in iodine. Iodine deficiency disorder is known as ***goitre*** or enlargement of the neck region. Deficiency of iodine causes mental retardation in children. Recent studies have shown a direct link between iodine deficiency and academic performance of children. Iodine deficiency disorders have been identified in many parts of India.

Iodine is necessary for growth and development.

To avoid goitre we must have iodine rich food sources in our daily meals. Iodized salt is a good source of iodine and we must consume it instead of the non-iodized salt.

Make iodized salt a part of your daily diet.

Certain foodstuff like cabbage, cauliflower, radish, ladies finger, oilseeds etc., contain substances known as *goitrogens* which interfere with the body's ability to produce and use thyroxine. These goitrogens are destroyed on cooking. Therefore, these foodstuffs should be cooked before eating.

INTEXT QUESTIONS 4.4

Answer the following questions–

1. What is the difference between iodized salt and normal salt?

   .....

   .....

2. What is the importance of calcium?

   .....

   .....

3. Name the two factors that enhance and that interfere with the absorption of iron in the body.

   .....

   .....

4. Which mineral is important for haemoglobin formation?

   .....

   .....

5. Bones in our body are made up of which mineral?

.....

.....

6. The lack of which mineral causes mental retardation in children?

.....

.....

Activity : From the last meal you ate, do the following:

i) List all the dishes you ate

ii) Identify the food items (ingredients) used in each dish

iii) From the above items, identify the macro and micro mutrients present in them.

S.No.	Dishes eaten	Ingredient	Nutrient	
			Macro	Micro

3. WATER

Water is the major constituent of our body. It forms about two-thirds of the body weight. We can do without food more readily than water. It is present in all the cells, being a vital part of all living tissues. It surrounds tissues and organs, and gives protection from shock.

Water helps in digestion, absorption and transportation of nutrients in the body. It helps to excrete unwanted materials in the form of urine and maintains body temperature through perspiration.

Normally, we need to drink 6-8 glasses of water everyday. Other forms in which we can receive water are milk, juice, kanji, etc.

Water is vital for survival

4.4 NUTRIENT REQUIREMENTS

Now we know that all the nutrients are required for good health. But how much should we eat so that our nutritional requirements are met? There are various factors which influence the nutritional requirements of an individual. Let us learn about them.

Table 4.3
Recommended Dietary Allowances for Indians (Recommended by ICMR)

Group	Particulars	Body wt	Net energy	Protein	Fat	Cal-cium	Iron	Vit.A. Reti-nol	β-caro-tene	Thia-min	Ribo-flavin	Nico-tinic acid	Pyri-doxin	Ascor-bic acid	Folic acid	Vit. B_{12}
		kg.	Kcal/d	g/d	g/d	mg/d	mg/d	µg/d	µg/d	mg/d	mg/d	mg/d	mg/d	mg/d	µ/d	µ/d
Man	Sedentary work		2425							1.2	1.4	16				
	Moderate work	60	2875	60	20	400	28	600	2400	1.4	1.6	18	2.0	40	100	1
	Heavy work		3800							1.6	1.9	21				
Woman	Sedentary work		1875							0.9	1.1	12				
	Moderate work	50	2225	50	20	400	30	600	2400	1.1	1.3	14	2.0	40	100	1
	Heavy work		2925							1.2	1.5	16				
	Pregnant woman	50	+300	+50	30	1000	38	600	2400	+0.2	+0.2	+2	2.5	40	400	1
	Lactation															
	0-6 months		+550	+25	45	1000	30	950	3800	+0.3	+0.3	+4	2.5	80	150	1.5
	6-12 months	50	+400	+18						+0.2	+0.2	+3				
Infants	0-6 months	5.4	108/kg	2.05/kg		500				55µg/kg	65µg/kg	710µg/kg	0.1	25	25	0.2
	6-12 months	8.6	98/kg	1.65/kg				350	1200	50µg/kg	60µg/kg	650µg/kg	0.4			
Children	1-3 years	12.2	1240	22			12	400		0.6	0.7	8			30	
	4-6 years	19.0	1690	30	25	400	18	400	1600	0.9	1.0	11	0.9	40	40	0.2-1.0
	7-9 years	26.9	1950	41			26	600	2400	1.0	1.2	13	1.6		60	
Boys	10-12 years	35.4	2190	54	22	600	34	600	2400	1.1	1.3	15	1.6	40	70	0.2-1.0
Girls	10-12 years	31.5	1970	57			19			1.0	1.2	1.3				
Boys	13-15 years	47.8	2450	70	22	600	41	600	2400	1.2	1.5	16				
Girls	13-15 years	46.7	2060	65			28			1.0	1.2	14	2.0	40	100	0.2-1.0
Boys	16-18 years	57.1	2640	78	22	500	50	600	2400	1.3	1.6	17				
Girls	16-18 years	49.9	2060	63			30			1.0	1.2	14	2.0	40	100	0.2-1.0

Nutritional requirements are influenced by:

- age
- height/weight
- sex
- climatic condition
- health
- occupation
- physiological condition

Indian Council of Medical Research (ICMR) after conducting a lot of research has recommended nutritional intakes for various age groups. You will find recommended dietary allowances (RDAs) given by ICMR for various physiological age groups in Table 4.3.

Have you noticed that a sedentary worker needs lesser calories than a person performing heavy work? There is a difference in energy requirements of males and females as well as physically fit or sick persons. Notice the difference in nutritional requirements of a woman during pregnancy and lactation and between boys and girls, men and women.

If you take a closer look at the above table, you will find the recommendations for infants, preschool and school children, adults and adolescents. Variations in energy needs according to activity are indicated in adult stage. Special requirements of pregnancy and lactation are also covered in the recommendation. A liberal margin of safety is provided in the recommended allowances to cover individual differences for need of the nutrients.

Activity : Let us see what you have learnt from table 4.3

Can you find out-

– How much extra protein pregnant lady needs?

– How much calcium does a lactating mother need?

– What is the requirement of iron for adolescent girls and boys (13-15 years) respectively?

INTEXT QUESTIONS 4.5

Tick mark (√) the most appropriate answer:-

1. Nutrition is the process by which the food is taken in and
   (a) digested in the body

(b) absorbed in the body
(c) utilized in the body
(d) all the above

2. The macro nutrients are carbohydrates, fats and
   (a) proteins
   (b) vitamins
   (c) minerals
   (d) all the above
3. Micro nutrients are
   (a) vitamins, water
   (b) vitamins, minerals
   (c) sugars and minerals
   (d) all the above
4. The amounts of nutrients required by different people are
   (a) the same
   (b) generally the same but occasionally different
   (c) at times the same and at times different
   (d) different

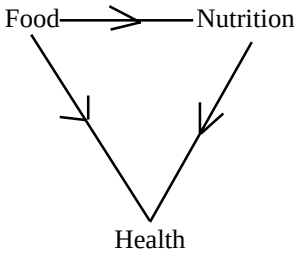
4.5 INTER-RELATIONSHIP OF FOOD, NUTRITION AND HEALTH

Earlier in this lesson you have learnt about the meaning and functions of food. You have also read the definition of health in previous unit. Let us now learn about nutrition in detail and understand how food and nutrition are related to health.

Nutrition is a scientific discipline in which food is a major focus of interest. The simplest definition of nutrition is ***the study of what happens to food once it enters the mouth and thereafter***. A more formal definition of nutrition is ***study of processes by which the living organism receives and utilizes the materials necessary for growth, renewal and maintenance of body components.*** All foods contain some essential substances which perform important functions in our body. These essential substances contributed by our food are called ***nutrients***.

These nutrients help us to maintain our body functions, that is, to grow and to protect our organs from diseases and infections.

The health of a person depends on the type and quantity of food stuff consumed. Good nutrition is essential for a person to grow and develop normally and to remain healthy throughout life. When a person does not eat proper food, there are chances of the body not developing normally. There are chances that some organs of the body may start malfunctioning or there may be some disease. Poor nutrition may also influence the mental and social well being adversely.



Good nutrition is a prerequisite for good health

INTEXT QUESTIONS 4.6

Test your word power -

Hope you have enjoyed learning about the Functions of food. While studying this lesson you must have come across some new words. Let us see how well you have understood their meaning. Given below are the words and their possible meanings. Choose the option closest to the real meaning of the word.

(1) Nutrient : (a) tasty food (b) balanced diet (c) essential substance for life and growth (d) waste product

.....

(2) Edible : (a) poisonous (b) fit to be eaten (c) spiritual (d) part of building

.....

(3) Digestion : (a) process of converting food into substance used by body (b) growth (c) cooking food (d) chemical reaction

.....

(4) Macronutrient : (a) large quantity (b) visible to the naked eyed (c) fixed amount (d) substance required in large amounts

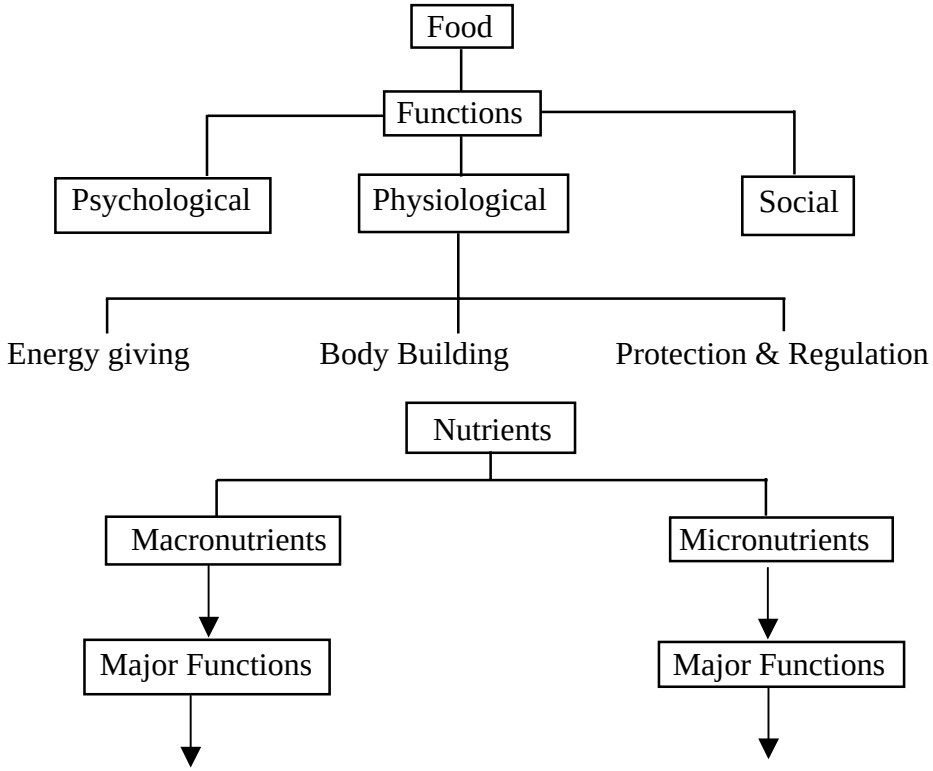
.....

(5) Legume : (a) cereal (b) dal (c) evergreen plant (d) cactus

* Rate yourself by giving 1 point for every currect answer.
Vocabulary Ratings: 4-5 : Excellent, 2-3: Good, 0-1: You need to read the lesson again.

.....

WHAT HAVE YOU LEARNT



- Carbohydrates: Energy
- Fats: Energy
- Protein: Body building
- Water: regulatory and excretory function
- Minerals: Calcium, iron, iodine: Body building and regulation
- Vitamins: Vitamin A: healthy vision
- Vitamin D: development of bones and teeth
- Vitamin E: Reproduction
- Vitmain K: Blood coagulation
- B complex: Normal growth and development
- Vitamin C: Normal teeth & bones

NUTRITION→Eat→Digestion→Absorption→Transportation→Utilization

Food → Nutrients → Nutrition → Health

TERMINAL EXERCISE

1 List the food items you had for dinner and identify the energy giving and body building foods.

2. Define macronutrients and micronutrients.

3. List the functions of carbohydrates and proteins.

4. Are the nutritional requirements of your family members the same or different? Give reasons.

ANSWERS TO INTEXT QUESTIONS

4.1 1. Item which is edible and nourishes the body

2. Social, psychological and physiological function.

3. 1. Energy giving
   2. Body building
   3. Regulatory function and protection from disease

4.2 1. (a) Refer to text

2. (a) False (b) True (c) True (d) False (Refer to text for reasons)

4.3 1. Water soluble - Vitamin B & C

Fat soluble - Vitamin A,D,E,K

2. (i) false, D (ii) true (iii) false, vit K is necessary for clotting the blood. Vit B complex helps in digistion and make us feel hungry. (iv) false, K (v) false

4.4 1. Iodine is obtained from iodized salt.

2. Bone development, blood clotting and muscular coordination

3. Vitamin C and protein facilitate absorption and oxylates and phytates interfere with the absorption.

4. Iron 5. Calcium 6. Iodine

4.5 1. (d) 2. (a) 3. (b) 4. (d)

4.6 1) Nutrient : (c) This is a substance that provides nourishment essential for the maintenance of life and growth

2) Edible : (b) fit to be eaten

3) Digestion : a) The process of breaking down the food in the stomach and using it for growth and development in the body.

4) Macronutrient : d) A substance required in relatively large amount by living beings.

5) Legume: b) Edible part of a leguminous plant used as food known in India as dal

4.7 (1) Energy giving foods - rice/wheat and potatoes
Body building food - milk, dals

(2) **Macronutrients -** Carbohydrates, proteins, fat

Required in large amounts

Micronutrients Vitamins and Minerals

Required in small quanities.

(3) Ref 4.6

(4) Ref 4.5

AUDIO - Quiz on Nutrients

VIDEO - Bhojan aur uske Poshak Tatva

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MEAL PLANNING

*I*n the previous lesson you have learnt about the meaning of nutrition and health and the inter-relationship between them. You are also familiar with the various nutrients present in food, their functions, requirement in the body and the factors influencing these requirements.

In this lesson, you will learn about grouping the foods into different groups according to their nutrient content. Inclusion of these food groups in our daily meals is important to provide an adequate diet.

This knowledge is essential to make sure that you are eating the right food in the right quantities. In this lesson, you will learn how to ensure nutritional adequacy of the food that you eat every day and how you can plan the same.

OBJECTIVES

After reading this lesson, you will be able to:

- categorise foods into food groups on the basis of nutrients;
- explain the term ‘balanced diet’;
- state the meaning of 'meal planning' and its importance;
- enumerate the factors influencing meal planning;
- analyse the nutritional needs of members of the family and modify the meals accordingly;
- define ‘therapeutic diet’ and its need;
- enumerate the types of modification of normal diet,
- suggest modifications of a normal diet for people suffering from common diseases.

5.1 FOOD GROUPS

The knowledge of recommended dietary allowances and composition of food is necessary for the selection of an adequate diet. But if we start doing this, it will be a tedious process. Therefore, it is necessary to translate the nutritional needs into kinds and amounts of food that we should eat. Such an information can then be used in everyday meal planning exercise. This is achieved by dividing/categorizing all food items into various groups called ***food groups***. Now let us see what is a food group.

A food group, quite simply, ***consists of a number of food items sharing some common characteristics.***

Let us see the two ways of classifying food into groups

- physiological, on the basis of function
- on the basis of nutrients

A. Classification Based on Physiological Functions

In the previous lesson you have studied that food has three basic physiological functions. Can you remember these? Yes, energy giving, repair and growth, protection and regulation.

B. Classification Based on Nutrients

Now we will study the classification based on the nutrients which they supply.

Table 5.1: Five Food Group System

Food Group	Main Nutrients
1. Cereals, Grains and Products Rice, wheat, ragi bajra, maize, jowar barley, riceflakes, wheat flour etc.	Energy, protein, fat, vitamin B_1, vitamin B_2, folic acid, iron, fibre
2. Pulses and Legumes Bengal gram, blackgram greengram, redgram, lentil (whole as well as dhals), cowpea, peas rajmah, soybeans, beans etc.	Energy, protein, fat, vitamin B_1, vitamin B_2, folic acid, calcium, iron, fibre

Fig. 5.1

Fig. 5.2

3. Milk and Meat Products		
Milk:	Protein, fat, vitamin B_2 ,	
Milk, curd, skimmed milk, cheese	calcium, vitamin A	
Meat:		
Chicken, liver, fish, egg, meat	Protein, fat, vitamin $B_{2,}$ vitamin A, vitamin B_{12}	**Fig. 5.3**
4. Fruits and Vegetables		
Fruits:		
Mango, guava, tomato ripe, papaya, orange, sweet lime, water melon	Carotenoids, vitaminn C, fibre, carbohydrates	
		Fig. 5.4
Vegetables *(Green Leafy)* Amaranth, spinach, gogu, drumstick leaves, coriander leaves, mustard leaves, fenugreek leaves	Fats, carotenoids, vitamin B, folic acid calcium, iron, fibre	
		Fig. 5.5
Other Vegetables: Carrots, brinjal, ladies finger, capsicum, beans, onion, drumstick, cauliflower	Carotenoids, folic acid, calcium, fibre	
		Fig. 5.6
5. Fats and Sugars		
Fats:		
Butter, ghee hydrogenated oils, cooking oils like ground nut, mustard, coconut oil	Energy, fat	
Sugars:		
Sugar, jaggery	Energy	**Fig. 5.7**

Note: Carotenoids are a form of vitamin A available from plant sources.

A ready recknoner is provided to give you a comprehensive information on the nutrients, their food sources and groups to which they belong.

In this system of food grouping, similar food items are placed together. For example, all cereals are similar in their nutrient content and all pulses are also similar in nutrient content. Similarly, milk, egg and flesh foods are comparable, all oils, butter, ghee have similar nutrients. Therefore, if we substitute one food for the other in the same group we will, to a large extent, get the same nutrients. For example, whether we select wheat flour, rice or bajra we would get approximately the same nutrients.

Substitution of one food item with the other in such a way that the nutrients provided by them are the same is called Food Exchange.

Food Exchanges make Diet Planning Easy

5.2 BALANCED DIET

You have already learnt about the nutrients, their sources and importance and also about nutritional requirements. Sometime back we raised a question- what should we eat so that our nutritional requirements are met? Do you think you can answer this question now? Yes, you are right - you should eat food items which provide all these nutrients to your body. Such a meal is called a balanced diet. By meeting our nutritional requirements such a diet helps us in staying healthy. It also provides some amount of nutrient for storage in the body. This helps the body to withstand short periods of dietary inadequacy.

A balanced diet is one which contains different types of foods in such quantities that the individual's need for the various nutrients is *adequately met, and some amounts of nutrients are stored in the body to withstand short periods of low dietary intake.*

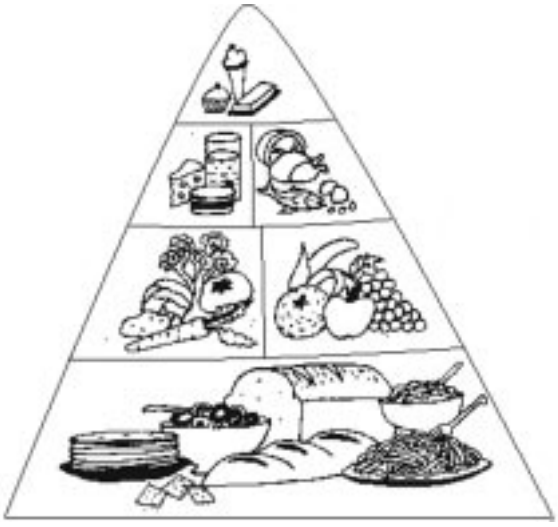


Fig. 5.8: Food pyramid

Characteristics of a Balanced Diet

A balanced diet contains both plant and animal foods and fulfills following requirements:

- meets the nutritional requirements of an individual
- includes foods from all the food groups
- contains a variety of foods

- consists of seasonal foods
- is economical
- suits the taste and meets the desires of the individual eating it

INTEXT QUESTIONS 5.1

1. In how many ways can foods be classified?
2. List the five food groups.
3. What is food exchange ? Give one example.
4. Tick mark (√) the most appropriate answer:
   (i) A balanced diet should consist of
      a) both plant and animal foods
      b) only plant foods
      c) only animal foods
      d) only cereals and pulses
   (ii) A balanced diet is one which has
      a) some nutrient in referred amount
      b) food from one food group in correct amounts
      c) all the nutrients in correct amounts
      d) all those foods that a person likes to eat in correct amounts

5.3 WHAT IS MEAL PLANNING?

Meal planning is making a plan of meals with adequate nutrition for every member of the family within the available resources. The term 'available resources' means whatever the family has in terms of time, energy and money.

IMPORTANCE OF MEAL PLANNING

Meal planning is important for meeting the nutritional requirements of the family members. It helps us to decide what to eat each day and in each meal. We can call it our 'daily food guide'.

Meal planning helps us to:

(a) fulfill the nutritional requirements of the family members
(b) make the food economical
(c) cater to the food preferences of individual members
(d) save energy, time and money
(e) use left over food

The following section, will help you to understand these points clearly.

FACTORS AFFECTING MEAL PLANNING

What guidelines do you keep in mind while planning meals? What all do you consider to make your meal planning effective? Yes, there are many factors such as-

1. **Nutritional Adequacy**

   This is the most important factor, which means that the nutritional requirements of all the family members are fulfilled. For example, you know a growing child needs more protein, a pregnant or lactating woman needs calcium, etc.

   While planning meals you will include food items from various food groups, that is, energy giving foods, body building foods and protective and regulating foods.

2. **Age**

   People normally eat according to their age. You must have observed in your family that the diet of various members of different age groups differs in quantity. A new born baby drinks only milk, a small child's meal is also of very small quantity, an adolescent eats still more in amount and variety of foods. Similarly, you must have seen your grandfather eating less food and also that they prefer soft and easy to digest foods.

3. **Sex**

   Sex is another factor which determines the dietary intake. Dietary requirement of adolescent and adult males are more than their female counterparts.

4. **Physical Activity**

   The kind of work a person does affects the kind and amount of food they need to take. Do you remember that RDA is different for people eng aged in different activities? A labourer not only eats more quantity but needs more energy because he is engaged in hard work. His body uses up more energy while performing hard work. So, if you have to plan for such a person you will include more energy giving foods in the diet.

5. **Economic Considerations**

   Money available to the family to be spent on food is another major factor. Foods like milk, cheese, meat, fruits, nuts etc. are expensive. However, alternative sources like toned milk, seasonal fruits and vegetables are less costly and at the same time nutritious. You can therefore plan a balanced diet to suit every budget.

Tips for economy

- Buy food in bulk, if you have enough place to store.
- Buy from fair price shops like ration-shops, superbazars, cooperative stores, etc.
- Compare prices and quality while buying.
- Make use of left-over food.

6. Time, energy and skill considerations

While planning the meals, you should consider the resources like time, energy and skill available to the family. Meals can be elaborate with different dishes but you can simplify them by cooking a simple but nutritious dish. For example, a working mother could prepare a paushtik pulao, instead of preparing three or four items for dinner.

7. Seasonal availability

Some foods are available in summers while some in winters. The off season foods are expensive and less nutritious, while those in season are fresh, nutritious, tasty and cheap. Hence, while planning seasonal foods should be used.

8. Religion, region, cultural patterns, traditions and customs

Regional factors influence meal planning. For example, if you are a North Indian, you will consume more of wheat, while those near the coastal region, will consume more of coconut, fish, etc. Similarly your staple food would be rice if you are a South Indian.

Religious beliefs prevalent in the family also have an influence. For example, if you are a vegetarian, your diet will not have any meat or meat product, Hindus do not eat beef and Muslims do not eat pork etc.

9. Variety in colour and texture

Examine the following two menus - which one is better?

Menu - I	Menu - II
Chapati Rice Arhar dal Pumpkin Vegetable Curd Salad (Radish and onion)	Chapati Rice Rajmah Fried ladyfinger Carrot raita Salad (Cabbage, cucumber, beetroot) Papad
Fig. 5.8	**Fig. 5.8**

The second one, as it has variety in terms of colour, texture, flavour and method of preparation. These factors help you to make meals more appealing, attractive and hence more acceptable.

10. Likes and dislikes of individuals

The food you serve should cater to the likes and dislikes of the individual family members. It is often better to change the form of some particularly nutritious food item, rather than omitting it completely. For example, if someone in your family does not like milk, you can

give it in the form of curd, paneer, etc. Similarly, if one does not want to take green leafy vegetables in cooked form, what alternative would you suggest, so that it can be taken in adequate amount? Yes, it can be used in a variety of ways - mixed with flour and made into paranthas or poories; or as culets or pakodas. It can also be given in the form of koftas, idlis, vadas, etc.

11. Satiety Value

While planning meals, take care that you select foods which provide satiety value. Meals which produce inadequate satiety, will lead to onset of hunger pangs, which in turn will affect the working capacity and efficiency of a person.

Satiety : Feeling of fullness after eating

INTEXT QUESTIONS 5.2

1. Answers the following questions.

   (a) What are the qualities of a well planned meal?

   (b) Differentiate between seasonal foods and out of season foods.

   (c) List at least two points you will keep in mind in order to prepare an attractive and appealing meal.

   (d) List the different types of work. Which kind of work requires maximum energy?

   (e) Your brother does not like lauki but your sister is very fond of it. How will you solve this problem?

2. Select nutritious snacks from following food items. (i) Poha (ii) French Fries (iii) Dokla (iv) Vegetable cutlets (v) Pizza (vi) Upma

5.4 MODIFICATION OF FAMILY MEALS FOR VARIOUS AGE GROUPS

Meal planning is an art and science in itself. What is to be cooked is decided by the homemaker from the available food items. But the meal planning is affected by various factors like nutritional requirements, budget, season etc. all of which you have studied earlier.

These factors various from family to family. Do you remember what you had for lunch? Usually it would have been chapati, dal, rice, cooked vegetables, salad, curd, sometimes, fruits or sweets. This is generally a **balanced meal**. Can you tell why? Yes, because it has food items from all the

food groups. This meal provides all the essential nutrients such as - energy, protein, fats, vitamins and minerals.

> The nutritional requirements of all the family members can be met by varying the quantity of food items and by combination of foods. Include food items from different food groups to get variety and maximum nutrients.

Consider a family having members in various age groups, that is, parents, grandparents, a school going child and an adolescent girl. Now, you know all of them have different requirements. If you have to cook for them how will you go about it? Will you cook specially for each member according to individual nutritional needs or cook a common meal and serve according to the various nutritional needs?

Definitely, the second alternative is a better choice. What are you doing here? You are modifying the **same** meal according to the needs of each member. This is what is known as diet modification. This can be achieved through two methods.

A. Through Modification in the Diet

Diet modification means serving the meal cooked for the family to any member after varying it in quantity, quality and frequency of eating.

1. Quantitative modification of diet

This refers to the increase or decrease in the number of times a meal is taken and/or the portion size (Portion size the amount of a particular dish eaten at a meal).

For example, pregnant women, sick people or older persons need to eat smaller meals but at shorter intervals, that is, they may need 6-8 meals instead of four meals a day. Similarly, adolescent boys needs larger portions at each meal (may be more rice/chapattis, more dal/curd) and also more frequent meals to meet their nutritional needs. Persons who are dieting are advised to reduce the amount of food eaten at each meal. This will force the body to use stored reserves which will help in reducing boy weight.

2. Qualitative modification of diet

It refers to the change in nutrients, consistency, flavour, amount of spices and fibre content of the diet. For example, the increased protein requirement of a pregnant woman can be met by increasing the quantity of protein rich foods in her diet. You must have seen mothers taking out some boiled dal in a separate bowl, mashing it and feeding it to babies between the age of 6 months to 1 year. Dal does not contain any spices, except salt and turmeric. Slightly older children are fed well cooked and mashed 'Khichri'. Older people need a diet soft in consistency and less spicy. This is a qualitative modification of diet.

3. Modification in terms of frequency

What would you suggest to a person whose requirements are increased but they are not able to increase the quantity of food in the original meals? Yes, you will suggest an increase in the number of meals instead. This means the should take something in between the main meals. This is diet modification in terms of frequency.

B. Through Food Exchange Method

If you are modifying the same meal for different family members, then how will you decide on how much of one item is equivalent to another one? If you are not sure about how to go about exchanging one food item with another in the correct proportion, then you may not be able to fulfill everyone's requirements correctly. For example, if you are exchanging milk with egg then you should know how much of milk is equivalent to one egg or if one does not want to eat egg, in that case, how much of pulses should be given instead?

Food exchanges help you to modify the diet for an individual according to needs, likes, dislikes and food habits and help you to make the diet more flexible and interesting. The following food exchange table gives you a fair idea about the exchanges that can be done among various foods, so that the nutrients derived by these foods remain the same.

Protein rich foods

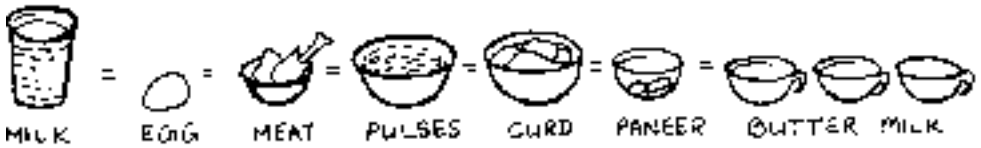


Fig. 5.9

1 glass of milk = 1 egg = 1 medium size katori meat = 1 big katori pulses = 1 big katori curd = 1/4 cup of paneer = 3 cups of butter milk

Cereals

Fig. 5.10

1 Chapati = 1 bread slice = 1 potato = ½ cup rice = ½ cup dalia = 4 salted biscuits = ½ cup noodles = 1 idli = 1 plain dosa = ½ cup upma/poha

Fats

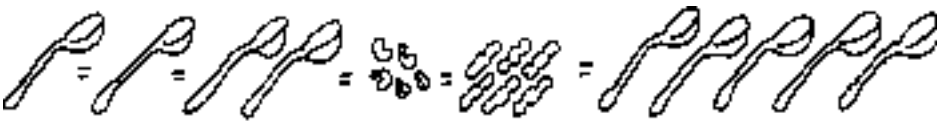


Fig. 5.11

1 tsp of butter = 1 tsp of oil = 2 tsp mayonnaise = 4-5 pieces of nuts = 10-12 pieces of peanuts = 5 tsp cream.

A Sample Menu of a Common Meal

While planning meals for different family members, keep in mind the nutrient content of food. You want that the common menu should be served to everyone. But this does not work out, as the needs of different individuals vary.

One easy way is to start with a sample menu for a healthy adult man engaged in normal activity. Plan for one person, decide how much to provide at different meals, according to the requirements. This becomes the ***reference menu*** for different family members according to their specific requirements.

1. Menu for an Adult Man/Woman

Here we are presenting sample menus for an adult man and a woman, who are engaged in moderate work. We will use these reference menus and you can modify them to suit the needs of other members.

Table 5.2
Sample menu for a person for engaged in moderate work

Meal	Menu	For man Amount	For woman Amount
Early morning	Tea	1 cup	1 cup
Breakfast	Aloo parantha	2	1
	Sprouted pulse raita	1 medium katori	1 big katori
	Boiled egg	1	1
Lunch	Chapatis	4	2
	Methi aloo vegetable	1 small katori	1 medium katori
	Urad dal	1 big katori	1 medium kotori
	Salad	half plate	half plate
	Fruit	1 orange	1 orange
Evening	Suji upma	1 big katori	1 big katori
	Tea	1 cup	1 cup

Dinner	Chapati	2	2
	Rice	half plate	quarter plate
	Rajmah curry	1 big katori	1 big katori
	Cauliflower vegetable	1 small katori	1 small katori
	Fruit custard	1 medium katori	1 medium katori

The energy content of the diet for an adult woman is nearly 2/3 of that for an adult man, and protein requirement is a little less. But her diet should be slightly richer in iron and vitamin C. We have provided her with less of cereals as compared to an adult man so as to decrease the energy content and she is also given less quantity of pulses in order to reduce the protein content of the diet.

But to compensate for her vitamin C and iron requirements, she is given more of sprouted pulse raita and methi-aloo vegetable, as compared to the sample menu for a man.

2. Modification for Pregnant Woman

You have already learnt in the previous lesson that during pregnancy, the need of calories, proteins, calcium, iron, vitamin A and vitamin C are increased for the healthy growth and development of foetus. Also, you should give her more of water and fibre, as she may suffer from the problem of constipation. But since she is not able to eat much at a time, you should give her small frequent meals. Keeping all these points in mind the menu has to be modified.

The calorie requirement of pregnant lady is 13% less than that of an adult man and can be done by reducing the quantity of cereals in her menu as compared to the reference menu. Her protein requirement is slightly higher, which can be compensated by giving her more of protein rich foods. The frequency of meals should be also increased, as compared to the sample menu.

Activity : Visit a pregnant woman. Record the following–

Name -

Age-

No. of children -

Any specific information related to pregnancy

Food eaten	Nutrients present	Suggestions for improvement

3. Modification for Lactating Mother

You are already aware of the fact that the nutrition of lactating mother is very important as the newborn baby relies completely on the mother for nutritional requirements. Inadequate food intake reduces the milk secretion. Her requirement is even greater than that of a pregnant woman. So while modifying her diet, you will take care that her meals are rich in energy, protein, calcium, vitamin A and C.

She should be given more of foods like milk, curd, pulse, which are rich in protein, calcium, and vitamin A. Further, to compensate for her requirements, an additional serving of egg and vitamin A rich food like mangoes are given to her as compared to the sample menu. The frequency of meals too should be increased to fulfill her extra needs.

Activity : Note down one day diet of a lactating woman in your area. From the diet note:-

Food eaten	Nutrients present	Suggestions for improvement

4. Modification for an Infant

Mothers milk is sufficient to meet the nutritional requirements of the baby upto 6 months.

Fig. 5.12

Fig. 5.13

Liquid (6 months) — Juice, soups, milk

Semi-Solid (6-9 months) — porridge, kheer, mashed banana or potatoes

Solid 9-12 months — Khichri, egg, chappati, vegetables and fruits

Weaning pattern for an infant

You know that by 6 months, infants are put on weaning foods to take care of their rapid growth and development. Weaning is a gradual process of shifting the child from breast milk to a normal household diet. A good diet during infancy is very important, since the foundation of future health is laid during this stage. They now need weaning foods rich in proteins, Vitamin A and specially calcium. The calorie requirements of infants is nearly ¼ and protein is 1/3 of that of adults. But they need more calcium than adults. So they should be given more of foods like milk, egg, green leafy vegetables etc. Keeping in mind all these factors, the sample menu can be modified in terms of quantity, quality and frequency.

5. Modifications for Children and Adolescents

A well balanced healthy diet is a must for all age groups. The modifications for various age groups are as follows:

Table 5.3 : Modifications for children

Pre-schoolers	School going Children	Adolescents
- A high calorie high protein diet, rich in calcium and vitamin A. - Mildly flavoured and less spicy foods to be given - Handy Finger Foods are preferred. Example - French fries, Sandwiches, vegetable rolls, Stuffed pranthas etc. - Foods should neither be too hot or too cold for the child to handle	- A high calorie, high protein diet with plenty of vitamins and minerals. - Need energy rich foods for their hectic activities both at school and home. - Packed 'tiffin' assumes a lot of importance as breakfast is usually skipped. 'Tiffin' should be tasty besides being nutritious.	- A high calorie, high protein diet, rich in calcium and iron. - Quantity of food intake must be increased to meet their rapidly changing body needs. - Nutritious fast foods and snacks should be planned. - Peer group influence affects food intake, it must be kept in mind while planning. - Starving crash dieting/erratic eating habits must be discouraged.

6. Modifications for old People

Many physiological changes occurring during old age affects nutritional requirements. They need less energy and fats as compared to an adult man but the proteins and other nutrient requirements remain the same. They need lots of water and fibre to check the problem of constipation. Also, you know that they may suffer from chewing problems, so give them soft and well cooked foods.

Now you have learnt how to adapt the same menu for various family members according to their requirements. It also saves time and effort and makes planning simple.

INTEXT QUESTIONS 5.3

1. Write short notes on
   (1) Qualitative modification
   (2) Food exchange
   (3) Quantitative modification
2. List the factors you will keep in mind while making a tiffin for school going children.

5.5 NEED FOR SPECIAL DIET

You are all aware that a normal diet satisfies the nutritional needs of a healthy individual. But when a person falls sick there is a malfunctioning of parts of the body, therefore, the nutritional needs of a sick person changes. For example, in diabetes, the pancreas do not produce insulin which is needed to digest sugars. In such a case, presence of the normal amount of sugar in the food will be harmful to the system. In jaundice there is malfunctioning of the liver, hence digestion of fats is affected and presence of normal amounts of fats in the diet will be harmful to health. In case of diarrhea, there is loss of body fluids and salts with every passage of stool. Also, the digestive system is unable to cope with the solid food eaten.

Under these circumstances, if one goes on eating normal food the system will be burdened and damaged. Hence, there is a need to modify the food eaten. Can you suggest some more reasons for modifying diet during diseases? Here are some reasons:

- to maintain good nutritional status

- to correct nutritional deficiencies
- to provide a change in the consistency of diet: liquid or semi-solid
- to bring about change in the body weight, if required.

THERAPEUTIC DIET

What is meant by 'Therapeutic Diet'?

> **Therapeutic diet is the special diet given to a person suffering from a disease, to facilitate recovery. It is a modification of the normal diet.**

Does the change in diet help the person to recover from disease? Yes, certainly. When sugars are withdrawn from food, insulin is not required to digest them. When fats are taken off the diet, the liver can relax and take time to recover. Drinking fluids certainly helps to overcome losses of water and minerals.

Some points to remember

While modifying the diet of a patient, keep the following points in mind:

1. Do not plan a completely different diet because:
   (i) Diets based on a person's daily diet have better acceptance.
   (ii) Such diet do not make a patient feel that he/she is eating something completely different from the family members.
   (iii) It is difficult to prepare.
2. Try to include only those foods which are liked by the patient, otherwise food may not be eaten at all.
3. Serve the meal in an attractive way to make them feel like eating.

TYPES OF MODIFICATION OF A NORMAL DIET

The types of modifications that may have to be made are as follows:

1. In diet consistency
2. In nutrient content
3. In interval and frequency of feeding

1. Modifications in diet consistency

In some diseases the thickness of the food has to be changed. The food can then be served in two consistencies:

1. Liquid
2. Semi solid

Sometimes, it becomes difficult to eat normal food. For example, in diarrhoea and fever you serve a liquid diet. This liquid diet includes milk, fruit juices, coconut water, nimbu-pani, tea, lassi, soups, cold drinks, etc. When one is little better you can serve khichdi, curd, custard, fruits, bread, cooked vegetables, etc.

2. Modifications in nutrient content

Depending on the nature of the diseases, modifications may need to be made in one or more nutrients in the diet. The modifications can be in terms of an increase or decrease in amount of the nutrient. For example, salt has to be reduced in high blood pressure, intake of carbohydrates has to be restricted in case of diabetes and fluid intake has to be increased in the case of diarrhoea.

3. Modifications in interval and frequency of feeding

Normally you eat 3-4 meals a day, that is, breakfast, lunch, tea and dinner. In sickness, you find it difficult to eat the amount you usually eat at one time. However, your body must get all the nutrients in correct amounts. Small amounts of food at intervals of 2-3 hours and as many as 8-10 small meals in a day instead of 3-4 meals facilitates speedy recovery.

INTEXT QUESTIONS 5.4

1. Differentiate between the following:
   (i) Normal diet and therapeutic diet.
   (ii) Modification in diet consistency and modification in frequency of feeding.
2. Write 'T' against true and 'F' against false statements. Justify your answer.
   (i) Sick people need only medicines for improving health.
   (ii) Diet plays no role in helping the patient to get well.
   (iii) Liquid diet consists of foods like nimbu-pani, fruit juices, coconut water, etc.
   (iv) The normal diet meets nutritional needs of all sick individuals.
   (v) The modified diet should be as similar to the normal diet as possible.

3. In diet therapy modifications of a normal diet are in terms of:

(i) .....
.....
.....

(ii) .....
.....
.....

(iii) .....
.....
.....

4. Categories the following food stuffs into liquid and semi-solid foods:

Sago kheer, soup, custard, khichdi, lassi, fruit juice

Liquids:.....
.....

Semi-solid foods:.....
.....

Activity

Visit a patient suffering from high fever. Do the following:

i) Record temperature with the help of thermometer.
ii) Enquire what the patient has eaten during the day.
iii) Ask if the patient has modified his normal diet during fever.
iv) Give suggestions for inclusion of appropriate food items during fever.

DIET IN SPECIFIC DISEASES

Now let us see what kind of food should be given to persons suffering from different diseases. These diseases may be due to infection - fever, hepatitis, diarrhoea or malfunctioning of some part of the body - hypertension, diabetes or constipation.

Activity

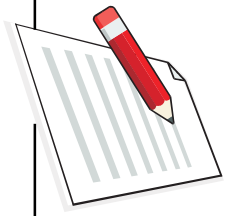
Using combinations of the following items, suggest four recipes each appropriate for diarrhoea and constipation.

Lemon, carrot, spinach, wheat flou, moong dal sprouts, banana, suji, juice, curd, milk, butter, potato, salt and sugar.

Diarrhoea	*Constipation*
1.	1.
2.	2.
3.	3.
4.	4.

Table 5.4

	MODIFICATIONS IN			FOOD TO BE	
DISEASES	**Diet consistency**	**Nutrient content**	**Interval and frequency of feeding**	**Taken**	**Avoided**
Diarrhoea	Liquid/semi solid	Low fibre	Frequent meals, intervals of 1-2 hrs	Soups, banana, biscuits, sago khichdi, potato, boiled egg, curd, dals, refined cereals	Whole cereals, chillies, whole pulses, fried food, guava, fruit with skin, leafy vegetables, pastries, milk
Fever	Semi solid diet	High calorie, high protein	Frequent meals at 2-3 hrs interval	Milk, egg, chicken, fish, juices, fruits, soups, lassi, dalia, kheer	Whole cereals, chillies, whole pulses, fried food, guava, fruit with skin, leafy vegetables, pastries, milk
Diabetes	No change	Normal diet with no sugar	Meals taken at fixed time, take six small meals/day	Vegetables, roti, dal, milk, curd, fruit, egg.	Sugar, sweet, honey, jam, jellies, cakes, pastries, sweetened fruits, cold drinks, tinned fruit
Hypertension	No change	Low calorie, low cholestrol, low salt	No change	Roti, dal, vegetables, milk, fruits	Food rich in cholesterol and salt like cheese, butter egg yolk, pickles, chutneys, papads, sauces
Jaundice	Start with liquids slowly go to a normal diet	Low fat	Small frequent meals at 1-2 hrs intervals	Roti, vegetable, dal, skimmed milk, fruit, sugar	Fried food-puri, pakoda, samosa
Constipation	No change	High fibre, drink lots of water	No change	Atta with husk, whole pulses, green leafy vegetables, guava	Refined foods like suji, rice, candies, bread, maida



INTEXT QUESTIONS 5.5

1. Match the diseases given in column A with the therapeutic diets given in colum B

	Column A		Column B
(i)	Diarrhoea	(a)	Low sugar diet
(ii)	Fever	(b)	Low fibre diet
(iii)	Diabetes	(c)	Low salt diet
(iv)	Hypertension	(d)	High protein, high energy diet
(v)	Jaundice	(e)	High fibre diet
(vi)	Constipation	(f)	High carbohydrate low fat diet

2. List five foods rich in each of the following nutrients

(a) Carbohydrates_____, _____, _____
_____, _____, _____

(b) Proteins_____, _____, _____
_____, _____, _____

(c) Fibre_____, _____, _____
_____, _____, _____

5.6 WRONG BELIEFS (MYTHS) REGARDING DIET

There are many wrong beliefs prevalent among people regarding diet. We present here only a few myths and the facts.

1. **Myth:** Diabetics can not eat rice or potatoes.
   Fact: A little amount can be taken daily.

2. **Myth:** Jaundice patients should not take fats or turmeric in their diet.
   Fact: Fats must be excluded for a while but turmeric is not harmful during jaundice.

3. **Myth:** Crash dieting or eating very little is good for losing weight fast.
   Fact: Starvation diet is harmful to the body. A controlled, high fibre, low calorie diet is recommended.

4. **Myth:** In diarrhoea, stop eating
   Fact: The body needs food to help recover. Stopping food only aggravates the problem.

5. **Myth:** In fever do not give hot foods.
   Fact: There is nothing like hot and cold food.

WHAT HAVE YOU LEARNT

Food Groups
- Cereals, grains
- Pulses and legumes
- Milk and meat products
- Fruits and vegetables
- Fats and sugar

Balanced diet → contains food from all 5 food groups

Meal planning is influenced by

- Nutritional adequacy
- Age
- Sex
- Activity
- Economic consideration
- Time, energy, skill consideration
- Seasonal availability
- Religion, region and culture
- Variety in colour and texture
- Likes and dislikes
- Satiety value

Family meals modified to suit the needs of

- adult woman
- pregnant woman
- lactating mother
- infant
- preschooler
- school going child
- adolescent
- elderly

Therapeutic Diet

Modification in

- Consistency
- Nutrient content
- Interval or frequency of feeding

Diet in different diseases

Diarrhoea	—	Low fibre, semi-solid
Fever	—	High energy, high protein
Diabetes	—	Normal diet with no sugar
Hypertension	—	Low energy, low cholestrol, low salt
Jaundice	—	Low fat
Constipation	—	High fibre

TERMINAL EXERCISE

1. Rama likes to eat three full meals a day. She is suffering from fever. Suggest modification in her diet.
2. Ashok is a factory worker. Every evening he plays foot ball with his friends. He has fractured his leg. Suggest modification in his diet so that he does not gain weight.
3. What do you understand by the term 'Balanced Diet'?
4. What is reference menu and how do you plan it?

ANSWERS TO INTEXT QUESTIONS

1. Two - (a) on the basis of physiological function
   (b) on the basis of nutrients
2. (a) Cereals and grains
   (b) Pulses and legumes
   (c) Milk and meat products
   (d) Fruits and vegetables
   (e) Fats and sugars
3. Substitution of one food item with the other in such a way that the nutrients provided by them are the same is called food exchange. Example wheat and rice
4. (i) a (ii) c
5. Paushtik roti/parantha, paushtik poha, vegetable pulao upma, vegetable sandwich.

5.2 1. (a) Nutritious, and include all food groups

(b) Seasonal foods are cheap, nutritious and abundant. Out of season foods are less nutritions & expensive.

(c) Colour, texture

(d) Heavy, sedentary and light. Heavy work requires maximum energy.

(e) By making lauki kofta instead of lauki curry. This is planning meal according to likes and dislikes of family members.

2. Nutritious snacks – (i), (iv), (v), (vi)

5.3 (i) Refer to text.

(ii) Refer to text.

5.4 1. i) Refer to text.

ii) Refer to text.

2. (i) False, nutritive diet builds the body's ability to fight sickness.

(ii) False, diet facilitates recovery.

(iii) True, as these are high in water content.

(iv) False, diet have to be adjusted according to the sickness.

(v) True, as they have better acceptance.

3. (i) Consistency

(ii) Nutrient content

(iii) Interval and frequency of feeding.

4. Liquids - soup, lassi, fruit juice

Semisolid foods - sago kheer, custard, khichdi

5.5 1. (i) Diarrohea - (a) low fiber diet

(ii) Fever - (d) high protein, high energy diet

(iii) Diabetes - (a) low sugar diet

(iv) Hypertension (c) low salt diet

(v) Jaundice - (f) high carbohydrate low fat diet

(vi) Constipation - (e) High fibre diet

2. (a) Carbohydrates - Chapati, rice, bread, dalia, suji.

(b) Proteins, milk, paneer, curd, egg, dals.

(c) Fibre - salads, guava, wheat (choker) whole grains, whole dals

6.1 1. The condition of health of a person that is influenced by the intake and utilisation of nutrients is called nutritional status.

2. (i) Overnutrition, Undernutrition

(ii) lack

(iii) obese

(iv) normal

AUDIO – Bhojan aur uske Poshak Tatva (Meal Planning)

VIDEO – Our food.

For more information log on to
http://www.llu/nutrition/vegguide.html#food

6

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NUTRITIONAL STATUS

You know that we need food to grow. The food that you eat is digested and absorbed in your body. The diet provides nutrients which are required in varying amounts in different parts of the body. These nutrients are utilised by the body for performing specific functions. This means that good nutrition is the basic component of good health. You have read about balanced diet. Do you remember that it is of utmost importance in achieving normal growth and development and for maintaining good health througout life? When your diet provides the nutrients in incorrect amounts, either very less or in excess of what is required, it results in an imbalance of nutrients in your body. This condition is responsible for various diseases, slow or no growth of body and it can even lead to death.

You know that young children, pregnant women and lactating mothers commonly suffer from health problems arising due to inadequate nutrition. There are several nutritional programmes prevailing in our country in order to solve this problem.

In this lesson, you will learn about the meaning of nutritional status and the ways of assessing it. You will also learn about the various nutritional diseases and different on-going nutrition programmes aimed to prevent and control these problems in our country.

OBJECTIVES

After studying this lesson, you should be able to:

- define the terms "nutritional status" and malnutrition;
- explain the types and causes of malnutrition;
- discuss simple ways to assess nutritional status;

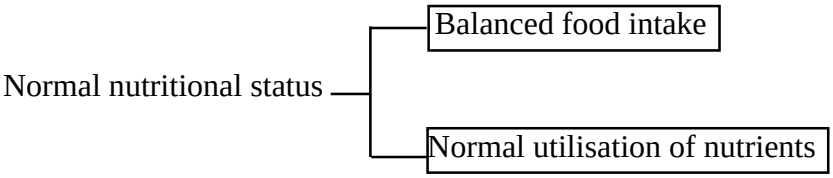
- recognise the signs and symptoms of common nutritional deficiency diseases;
- explain the importance of national nutrition programmes and list some of them;
- state salient features of these programmes.

6.1 NUTRITIONAL STATUS

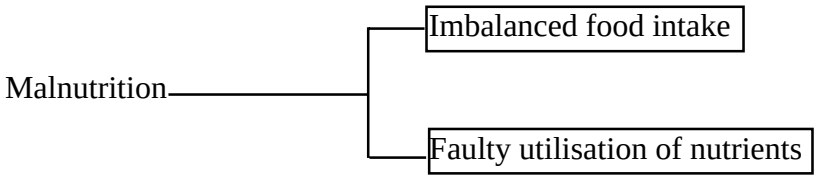
The condition of health of a person that is influenced by the intake and utilisation of nutrients is called nutritional status.

You know that we need a nutritious diet for our well-being and good health. When our body receives all the nutrients in appropriate amounts so as to meet the needs of the body, then we are in the state of good nutrition. We have a normal nutritional status.

However, when the nutrients provided in the diet are inadequate or not utilised properly, it results in a state of imbalance in the body. If this continues for sometime it may develop into a severe problem which may even prove fatal.



When there is a lack or excess intake of one or more nutrients and/or faulty utilisation of nutrients in our body, it leads to the state of imbalance in the body. This condition is known as malnutrition.



There are two types of malnutrition. The condition of health of a person that results due to the lack of one or more nutrients is called ***undernutrition***. However, when there is an excess intake of nutrients, it results in ***overnutrition***.

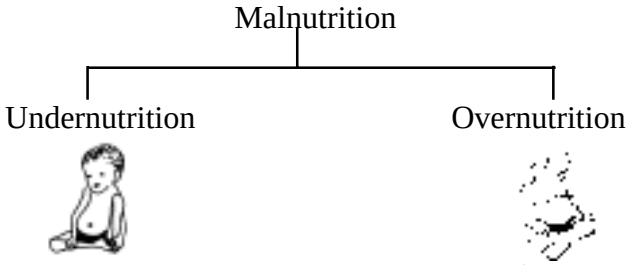


Fig. 6.1

Fig. 6.2

Thus the condition of malnutrition covers both the states of undernutrition and overnutrition. You must have seen people who eat energy rich foods in amounts more than what is required by their bodies become fat/obese. This is the result of overnutrition. This state of being obese is harmful as it may lead to serious health problems. But undernutrition is more common around us. In fact malnutrition has become a synonym of 'undernutrition'.

INTEXT QUESTIONS 6.1

1. What is 'Nutritional Status'?
2. Fill in the blanks in each of the following statements by choosing the appropriate word from those given in the brackets :

   (deficiency, overnutrition, obese, undernutrition, normal)

   (i) Malnutrition refers to both _____ and _____

   (ii) Undernutrition results due to _____ of one or more nutrients.

   (iii) If you eat too much of energy rich foods, you may become _____.

   (iv) Eating balanced food and having normal utilisation of nutrients leads to _____ nutritional status.

6.2 CAUSES OF MALNUTRITION

Do you know why malnutrition occurs? Let us look into some of the important factors responsible for causing it.

	Causes	Influences
I.	Decreased availability of food due to i. Increase in population (many mouths to feed) ii. Low production iii. Exhaustion of stocks	Lowered food intake
2.	Ignorance	Wrong infant feeding practices, inability to make correct choice of food resulting in over/undernutrition
3.	Economic conditions	Lowered purchasing power causing undernutrition/higher purchasing power causing overnutrition

4.	Stress conditions	Inability to meet the increased nutrient needs during periods of rapid physical growth, e.g. in young children, adolescents, pregnant woman and lactating mothers; Nutrient demands also increases during illnesses.
5.	Poor personal hygiene and environmental sanitation	Increased susceptibility to infections and thereby illnesses

Can you think of the consequences of malnutrition?

Yes, indeed malnutrition has serious ill-effects. The people affected by malnutrition suffer from deficiencies of different nutrients and have infections. They also have poor physical as well as mental growth and development which cause various handicaps. Malnutrition can also lead to death.

It also leads to decreased work capacity of malnourished population.

INTEXT QUESTIONS 6.2

1. Enlist the most important causes of malnutrition (undernutrition).
   _____ _____ _____
   _____ _____ _____
2. Malnutrition may even lead to _____ of many people.
3. The consequences of malnutrition are _____,
   _____, _____ and _____.

6.3 ASSESSMENT OF NUTRITIONAL STATUS

Now you will wonder, as to how to know your own or your friends nutritional status. **The process of determing the nutritional status of an individual or a group is known as nutritional assessment.**

There are a few simple ways by which you can know the nutritional status of yourself as well as of others. These procedures are -

1. By measuring physical growth;
2. By determining dietary intake;
3. By recognising nutritional deficiency diseases.

1. Physical Growth

You know that growth is most rapid during early childhood. Therefore, chil-

dren below 5 years of age are most susceptible to malnutrition. Growth can be determined by measuring the body weight and height. A child at a particular age must have a specific height and weight. In other words, the body weight and height of the child can become the indicator of his/her nutritional status.

How do you know whether a child has normal weight and height? There are standard weights and heights which the child is expected to attain at a particular age. These are called **references** and are shown in Tables 6.1. In case the weight and/or height of the child are below the reference, then the growth is considered to be retarded and we can say that the child is suffering from malnutrition.

Table 6.1
EXPECTED HEIGHT AND WEIGHT FOR AGE

BOYS		GIRLS	
Height (cm)	Weight (kg)	Height (cm)	Weight (kg)
76.1	10.2	74.3	9.5
82.4	11.5	80.9	10.8
85.6	12.3	84.5	11.8
90.4	13.5	89.5	13.0
99.1	15.7	93.9	14.1
99.1	15.7	93.9	15.
102.9	16.7	101.6	16.0
106.6	17.7	105.1	16.8
109.9	18.7	108.4	17.7
113.1	19.7	111.6	18.6
116.1	20.7	114.6	19.5
119.0	21.7	117.6	20.6
121.7	22.9	120.6	21.8
124.4	24.0	123.5	23.3
127.0	25.3	126.4	24.8
129.6	26.7	129.3	26.6
132.2	28.1	132.2	28.5
134.8	29.7	135.2	30.5
137.5	31.4	138.3	32.5
140.3	33.3	141.5	34.7
143.3	35.3	144.8	37.0
146.4	37.5	148.2	39.2

149.7	39.8	151.5	41.5
153.0	42.3	154.6	43.8
156.5	45.0	157.1	46.1
159.9	47.8	159.0	48.3
163.1	50.8	160.4	50.3
166.2	53.8	161.2	52.1
169.0	56.7	161.8	53.7
171.5	59.5	162.1	55.0
173.5	62.1	162.4	55.9
175.2	64.4	162.7	56.4
176.2	66.3	163.1	56.7
176.7	67.8	163.4	56.7
176.8	68.9	163.7	56.6

For example, Sita is 4 years old. Her weight is 12 kg and her height is 99 cm. Look at Table 6.1 and comment on her nutritional status. Compare her weight and height with the reference of a 4 year old girl. Ideally, she should weight 16 kg and should be 101.6 cm tall at her age. In other words not only does Sita weigh less she is also short for her age. This means that her nutritional status is poor and she may be considered as malnourished.

On the other hand, if a child has height and weight (specially) more than the references, he/she is said to be overnourished. This is also harmful for the body.

Activity 6.1: Take weights and heights of 5 children around you. Compare them with the reference tables. What do you observe?

S.No	Age	Height (cm)	Weight (kg)	Observation (Overnourished/ undernourished)
1.				
2.				
3.				
4.				
5.				

You should remember that recording regular weights, say once a month, is important. Excessive weight gain or loss is harmful and should be immediately attended to.

2. Dietary Intake

It is the second method of assessment. You will remember that balanced diet is essential for all of us to remain healthy.

To assess the nutritional status one needs to record all the food items consumed in the last 24 hours. Household measures are used for recording the food intake.

This information can then be compared with the 'food pyramid' given in Figures 6.2 and 6.3. These figures are applicable for adult man and woman. The number of portions (servings) can be adapted for various physiological groups. By comparsion, one can know whether a person is consuming a normal/ recommended diet or not.

The amount of intake indicates clearly whether a person has normal nutritional status or not. Let us know the method of determing your nutritional status -

(i) Note down whatever food items are eaten on one particular day along with the amounts of raw food items, in grams.

(ii) Now group the food items into different food groups and find out the respective total amounts.

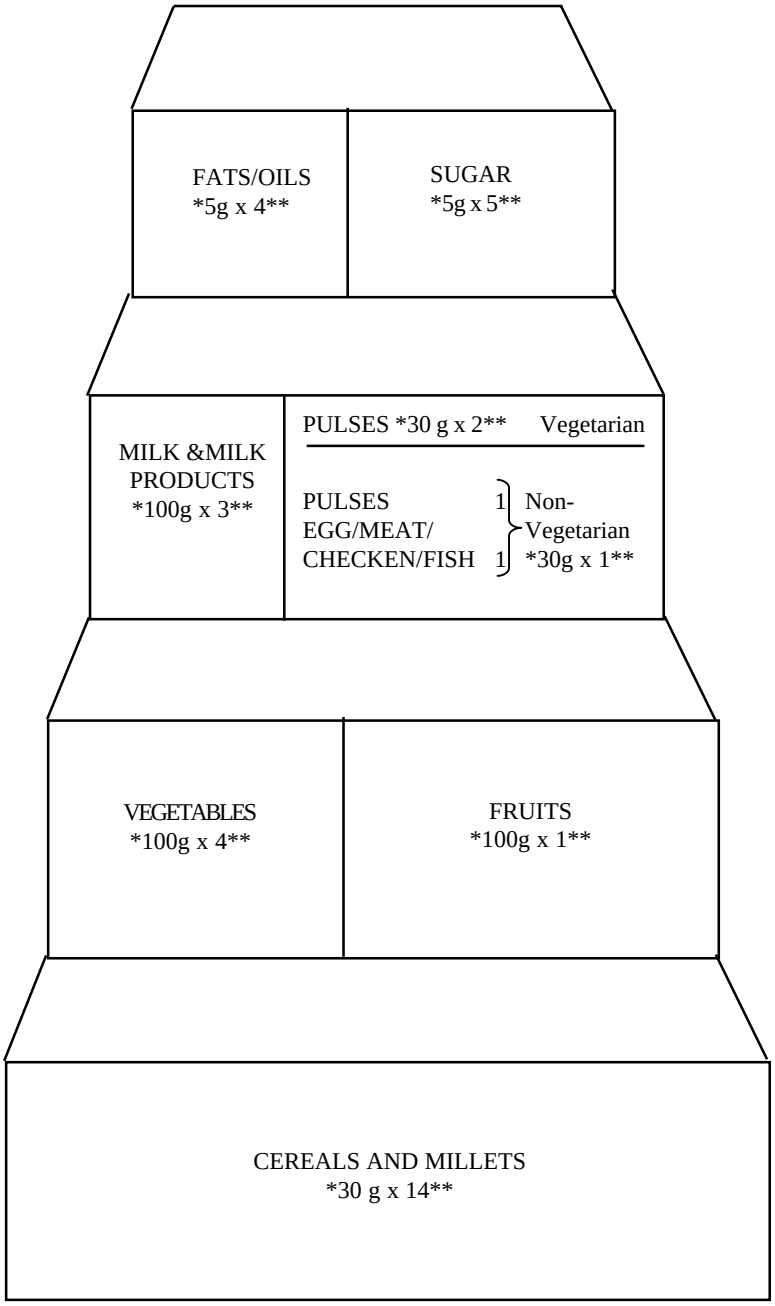
(iii) Lastly, compare the differences in amounts of each food group with the recommended dietary intakes for the age and sex.

The dietary intakes similar to the recommended dietary intakes will mean a normal nutritional status.

You can assess the nutritional status of any one by determining their dietary intakes in a similar way and compare their intakes with those recommended for their age and sex.

Activity 6.2: Maintain and note down all the food items that you have taken for a week and identify the main nutrient present in them.

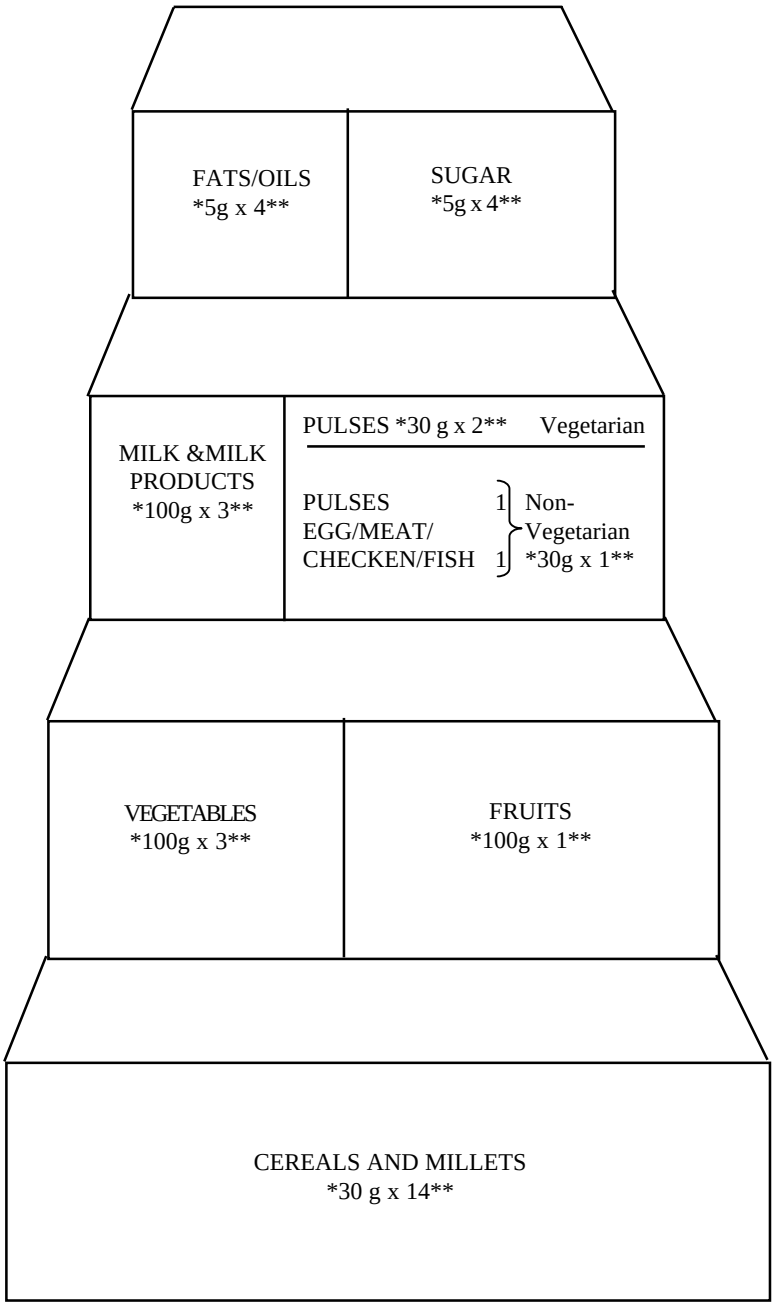
Days of the week	Breakfast		Lunch		Evening Tea		Dinner	
	Food item	Nutrient	Food item	Nutrient	Food item	Nutrient	Food item	Nutrient
Monday								
Tuesday								
Wednesday								
Thursday								
Friday								
Saturday								
Sunday								



* Portion Size ** No. of Portions

Elderly man : Reduce 3 portions of cereals and millets and add an extra serving of fruit.

Fig. 6.3 : Balanced diet for adult man (sedentary)



* Portion Size ** No. of Portions

Extra Portions:

Pregnant women	:	Fat/Oil-2, Milk-2, Fruit-1, Green Leafy Vegetables-1/2
Lactating women	:	Cereals-1, Pulse-1, Fat/Oil-2, Milk-2, Fruit-1, Green Leafy Vegetables-1/2

Between 6-12 months of lactation, diet intake should be gradually brought back to normal.
Elderly women: Fruit-1, reduce cereals and millets-2

Fig. 6.4 : Balanced diet for adult woman (sedentary)

3. Recognising Nutritional Deficiency Diseases

You can also assess the nutritional status of a person by observing the signs and symptoms of various nutritional deficiency diseases. The presence of one or more deficiencies will mean poor nutritional status.

You have already read that when the nutrients provided in the diet are either consumed below the required levels or are not properly utilised by the body, it results in the state of nutritional imbalance. This leads to "nutritional deficiency" in the body.

For example, vitamin A is important for normal vision in dim light. If your diet does not provide sufficient vitamin A, it will lead to vitamin A deficiency in your body. It will affect the normal functioning of your eyes, for example, you will not be able to see in the dark (night blindness), your eyes will lose clarity and may become cloudy/muddy.

Similarly, you will see that the child suffering from protein and energy malnutrition is shorter and thinner as compared to the other children of same age eating sufficient energy and proteins in their diets. Such physical differences are indicative of a nutritional deficiency disease. These are usually specific and are, therefore, helpful in recognising different deficiency diseases in and around you.

6.4 NUTRITIONAL DEFICIENCY DISEASES

How will you recognise a nutritional deficiency disease? What are the consequences of deficiency diseases? Let us discuss these diseases one by one.

1. Protein Energy Malnutrition (PEM)

PEM is one of the major nutritional problems in our country. It can occur at any age, but it mainly affects the young children. It results due to:

- lack of energy and proteins
- lack of proteins alone in the diet.

You may ask how are protein and energy deficiencies related? Actually, energy deficiency can cause protein deficiency. Let us see how this happens:

The body gets energy from carbohydrates and fats. When these are not present in adequate amounts in the diet, the body cannot meet its energy needs. It then uses proteins for the supply of energy thereby resulting in deficiency of proteins in the body, hence PEM.

Low energy (carbohydrates and fats) intake
↓ leads to
Deficiency of energy in the body

↓ leads to

Use of proteins for giving energy because the avilability of carbo hydrates is low

↓ leads to

Deficiency of proteins in the body

Protein energy malnutrition is of two types:

1. Marasmus
2. Kwashiorkor

Growth retardation and decrease in amount of muscle are seen in both marasmus as well as kwashiorkor. Can you say why? Yes, you are right. Food that these children eat is deficient in energy foods and proteins are used for providing energy.

Table 6.2
Differences between Marasmus and Kwashiorkar

Marasmus	Kwashiorkar
Causes	
Deficiency of both energy and proteins	Deficiency of proteins alone
Age group	
Before 12 months of age	Young children between 1-3 years of age
Signs and symptoms	
Loose and wrinkled skin due to loss of fat beneath the skin	Oedema/swelling due to water accumulation in the body especially on face, arms and legs
Shrunken abdomen	Pot belly
Hunger	Loss of appetite
Diarrhoea (often)	Skin rash which tends to peel off
	Light coloured hair which are easy to pull
	Liver enlargement

Fig. 6.5

Fig. 6.6

These are the extreme forms of PEM. They can even lead to death. The milder forms of PEM are much more common and are associated with infections and other nutrient deficiencies.

2. Vitamin A Deficiency

The lack of vitamin A in the diet leads to vitamin A deficiency.

Signs and symptoms

(i) Eye changes begin with night blindness, that is, inability to see when it is dark. If it is not treated, it leads to complete blindness.

(ii) Drying of the white portion of the eye.

(iii) Increased rate of infections especially of the respiratory system.

3. Anaemia

Anaemia means low level of haemoglobin in the blood. Haemoglobin is the red pigment in the blood and it helps in carrying oxygen to different parts of the body. Haemoglobin level decreases when iron is deficient in the diet. In other words anaemia is caused due to deficiency of iron. Anaemia can also be caused when there is lack of folic acid and vitamin B_{12} in the diet.

Signs and symptoms

(i) General body weakness. The person complains of tiredness and breathlessness.

(ii) Loss of appetite.

(iii) Paleness of tongue, white portion of eye and nail beds.

(iv) Feeling of being pricked with pins and needles on the fingers and toes.

(v) Brittle and spoon shaped nails.

(vi) The capacity of a person to work decreases considerably.

4. Iodine Deficiency

Iodine is an important component of thyroxine hormone. This hormone controls most of the metabolic processes of the body.

Iodine deficiency is most commonly seen as goitre in adults and cretinism in young children. Iodine deficiency during pregnancy is harmful both for the mother and child. However, you must remember that these are not the only problems of iodine deficiency disorders (IDD).

Signs and symptoms

In adults

(i) The neck becomes swollen. This is called goitre.

(ii) The person may become fat.

(iii) The person feels tired and is unable to work properly.

(v) Skin changes may also occur.

In young children

(i) Growth retardation

(ii) Mental retardation

(iii) Speech and hearing defects

(iv) Disorders of nerves and muscles causing inability to control movements of limbs.

Activity 6.3

Visit your neighbourhood. Do the following:

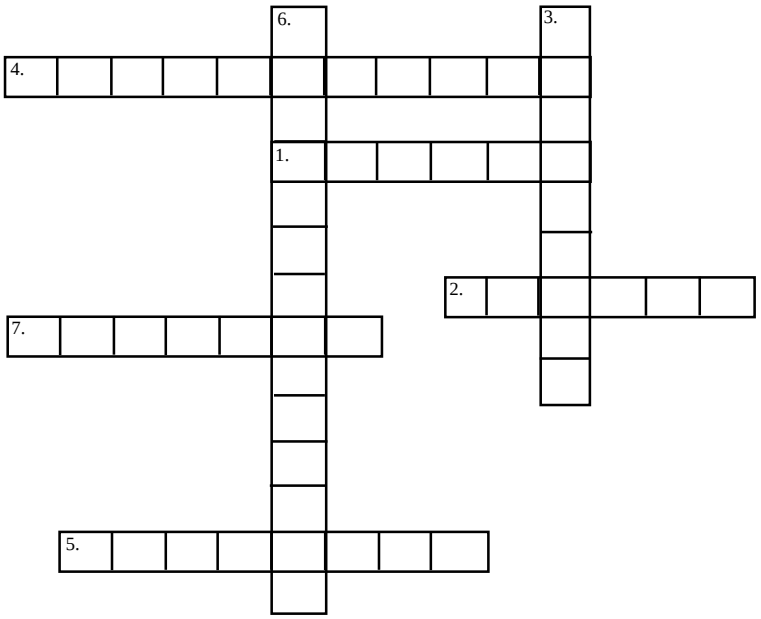
(i) Look for the signs and symptoms of the deficiencies you have studied here in any 5 people around you.

(ii) Identify the nutritional deficiency diseases they are suffering from. List your observations in the table given below.

S.No	Signs and Symptoms	Deficiency

INTEXT QUESTIONS 6.3

Fill in the crossword puzzle using the clues given below -



i) Physical growth can be determined by measuring _____ and_____. (1, 2 accross).

ii) IDD is seen in the form of _____ in young children. (3 down)

iii) Two forms of PEM are _____ and _____. (4, 5 accross).

iv) _____ is a sympton of vitamin A deficiency. (6 down).

v) Low level of haemoglobin means _____. (7 accross).

6.5 NATIONAL NUTRITION PROGRAMMES

The prevalence of the nutritional deficiency diseases is widespread in our country. You know that these diseases have serious ill-effects on the health and survival of the people. Also, you must know that with little care these diseases can be avoided. In order to control this situation, several National Nutrition Programmes have been launched in our country. These programmes provide nutritional benefits to susceptible groups. Do you know who are most susceptible to the problems of deficiencies? Yes, young children, adolescents, pregnant women and lactating mothers.

Let us now read about some of the important national nutrition programmes. By knowing the services provided, you can benefit yourself as well as others from these nutrition programmes.

1. Integrated Child Development Services (ICDS) Scheme
2. Mid Day Meal Programme (MDMP)
3. National Control Programme for Prevention of Nutritional Blindness due to Vitamin A deficiency
4. National Nutritional Anaemia Control Programme (NNACP)
5. National Iodine Deficiency Disorder Control Programme (NIDDCP)

1. Integrated Child Development Services (ICDS) Scheme

You know that children of today are future of tomorrow. If we take proper care of them, they will grow into healthy adults.

Imagine, if children do not get enough to eat then they will not be healthy. An unhealthy child will not be interested in studying. Similarly, if a child is suffering from diarrhoea, supplementary feeding will not be beneficial and it will not lead to improvement in the nutritional status of the child. Therefore, it is important to provide nutrition, health care and education together as a complete package of services. It is for this reason that ICDS programme was launched in our country. It has been successful because all the components essential for growth and development of children are included in it.

ICDS package provides:

Health

- Immunization
- Health check-ups
- Referral services
- Treatment of minor illnesses

Nutrition

- Supplementary feeding
- Growth monitoring and promotion
- Nutrition and Health Education (NHE)

Early Childhood Care Pre-School Education

- To children in the age group of 3-6 years

Convergence

- Of other supportive services, such as safe drinking water, environmental sanitation, women's empowerment programmes, non-formal preschool education and adult literacy.

The services under the ICDS scheme are provided at centres called **Anganwadis**. The health services are provided at the **Child Health Centres** (CHC). Have you ever visited a CHC (formerly called Primary Health Centre or PHC) in your area? If yes, you must have seen that besides providing health services like immunization, health check-up, treatment of minor illness, the CHCs also provide referral services. Referral services mean that if a person is suffering from 'a serious health problem, he/she is referred to a bigger hospital for medical treatment'.

Beneficiaries

- Children below 6 years of age
- Adolescent girls between 11 and 18 years
- Pregnant women and lactating mothers
- All women between 15 and 45 years

2. Mid day Meal Programme (MDMP)

The main aim of MDM programme is to provide supplementary meal to primary school children between 6 and 11 years of age. This in turn ensures school attendance.

3. National Control Programme for Prevention of Nutritional Blindness Due to Vitamin A deficiency

This programme aims at preventing blindness due to vitamin A deficiency.

The services provided under this programme include:

(i) Promoting consumption of vitamin A rich foods

(ii) Providing massive doses of vitamin A orally to children between 6 months to 5 years of age.

Beneficiaries

- Children between 6 months to 5 years of age
- Pregnant women and lactating mothers
- All women between 15 and 45 years

4 National Nutritional Anaemia Control Programme (NNACP)

This programme aims at significantly decreasing the prevalance and incidence of anaemia in young children and women.

The services provided through this programme are :

(i) Promotion of regular consumption of foods rich in iron

(ii) Providing iron and folic acid supplements

(iii) Treatment of severe anaemic cases.

Beneficiaries

- Children between 6 months to 5 years of age
- Pregnant women and lactating mothers
- All women between 15 and 45 years

5. National Iodine Deficiency Disorder Control Programme (NIDDCP)

The aim of this programme is to decrease the prevalence of Iodine deficiency disorder (IDD) in our country by providing iodine in the common salt (iodized salt).

The services provided are:

(i) To assess the extent of the problem

(ii) To arrange for production/supply of iodized salt

(iii) To take quality control measures in order to ensure supply of standard quality of iodized salt to the consumer

The government is ensuring that all the salt that is produced in our country is iodzed before it reaches the consumer. Steps are also taken to make the people aware about the consumption of iodized salt.

Activity 6.4: Find out from your health centre about the nutritional programmes operating in your area and what you can do to help yourself and other people to benefit from them.

Activity 6.5: Can you think and note down the name of popular brands of iodised salt which you have seen or heard about from T.V. magazines, markets etc.

Nutrition programme	Services	Beneficiaries	How can you help

INTEXT QUESTIONS 6.4

1. Indicate whether the following statements are true or false. Justify your answer.

   (i) The only beneficiaries of the ICDS programme are children below 5 years of age.

   .....

   (ii) National IDD control programme aims to decrease the prevalence of night blindness in our country.

   .....

   (iii) Massive doses of vitamin A are given orally to children below 6 months of age.

   .....

   (iv) Iron and folic acid supplements are given to prevent anaemia.

   .....

2. Rearrange the jumbled words to find out the names of ongoing major nutrition programmes of our country.

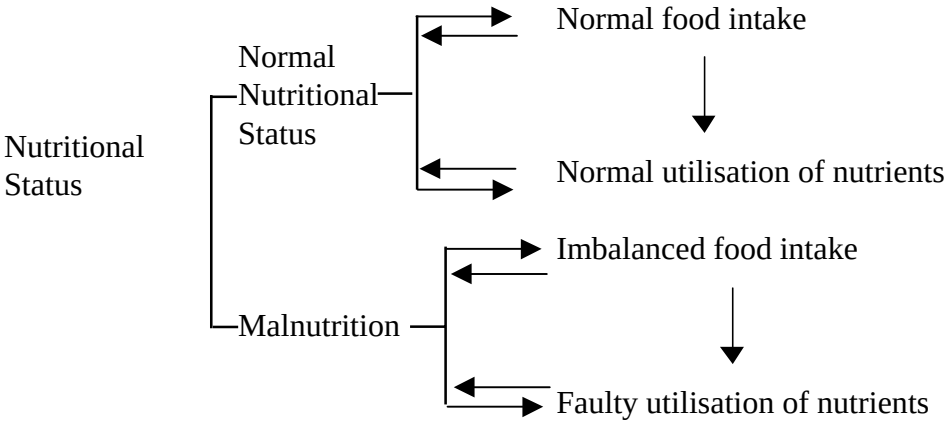
   (i) D C S I _____

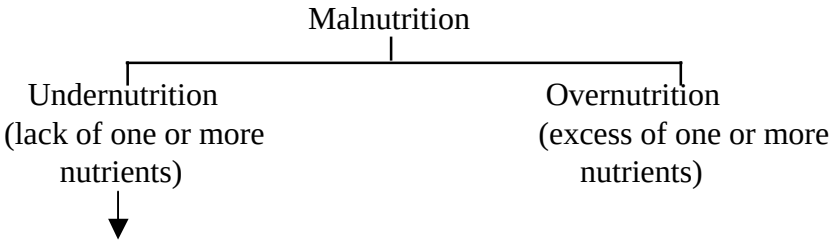
   (ii) P M D M _____

   (iii) P C N D I D _____

   (iv) P N A N C _____

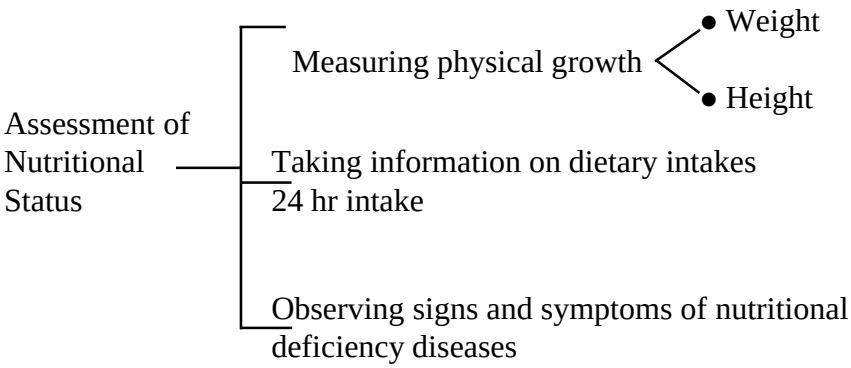
WHAT YOU HAVE LEARNT





Causes of Malnutrition :

- Decreased availability of food
- Increasing population
- Ignorance
- Poverty
- Poor personal hygiene and environmental sanitation
- Stress conditions


Assessment of Nutritional Status
Measuring physical growth
Weight
Height
Taking information on dietary intakes 24 hr intake
Observing signs and symptoms of nutritional deficiency diseases

TERMINAL QUESTIONS

1. What do you mean by nutritional status? Discuss.
2. Describe the various methods of assesing nutritional status of a person.
3. Make a list some of the common nutritional deficiency diseases. State signs and symptoms of each.
4. Explain the importance of National Nutrition Programmes. Give the services and beneficiaries of five important National Nutrition Programmes in our country.

Name of the programme	Services	Beneficiaries

ANSWERS TO INTEXT QUESTIONS

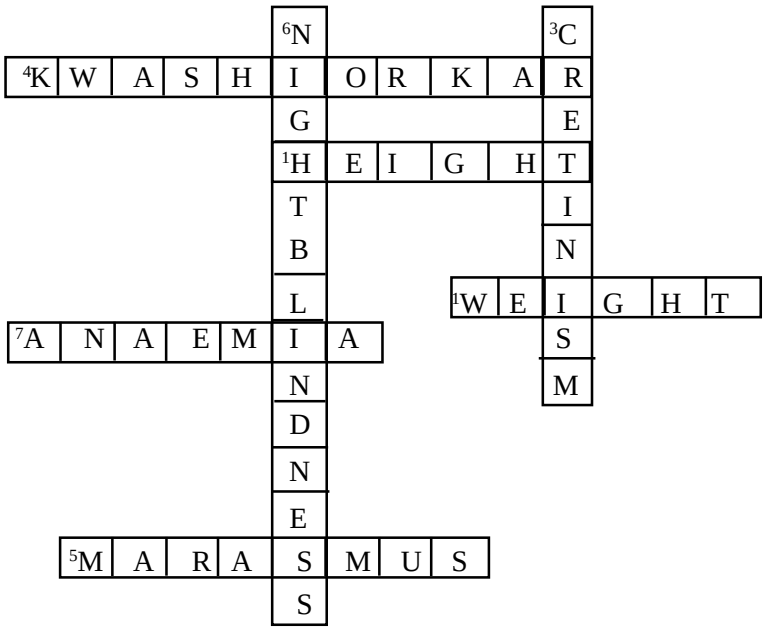
6.1 1. The condition of health of a person that is influenced by the intake and utilisation of nutrients is called nutritional status.

2. (i) undernutrition, overnutrition
   (ii) deficiency
   (iii) obese
   (iv) normal

6.2. 1. 1. Decreased availability of food
   2. Poverty
   3. Ignorance
   4. Less intake during pregnancy and lactation
   5. Infection
   6. Lower production of food

2. death

3. poor physical growth, mental growth, physical handicaps, deaths.



6.4.1 1. (i) False, ICDS scheme benefits not only children but adolescents, pregnant and lactating women and all women between 15-45 years of age.

(ii) False, The aim is to prevent Iodine deficiency disorder.

(iii) False, beneficiaries are children from 6 months to 5 years of age.

(iv) True, these are epecially for pregnant and lactating women and all women in the age group of 15-45 years.

2. (i) ICDS (ii) MDMP (iii) NIDDCP (iv) NNACP

AUDIO

VIDEO - Our Food

For more information log on to
http://www.llu/nutrition/vegguide.html#food

7

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PURCHASE AND STORAGE OF FOOD

All of us purchase food from the market. Some of us also grow food at home. While purchasing food we pick and choose from a variety of foods that are sold in the market. Some foods are cheap, some expensive, some are fresh and some stale, some are in season and some are out of season. All these factors influence our choice of food while buying. Since buying in bulk is cheaper and convenient, we generally buy more than what we require at any given time. Hence after buying, our next problem is to store the foodstuff. Even if we are careful we sometimes find food spoilt, vegetables smelling and dals being eaten by insects. Why does this happen? Is this because we did not select the foods carefully or because they were not stored properly? What happens if a spoilt food is accidentally consumed? You will find answers to these and similar questions in this lesson.

OBJECTIVES

After reading this lesson, you will be able to:

- explain the terms perishable, semi-perishable and non-perishable and classify food items accordingly;
- state indicators of quality for all kinds of food items;
- use the quality indicators for selection and purchase of food;
- adopt appropriate methods of storage of food;
- define food spoilage and explain its causes;
- state the importance and procedure of safe food handling.

7.1 PERISHABILITY OF FOODS

'Perishable' is a term used in the context of food that goes bad quickly. You must have noticed that if you keep the milk at room temperature, specially in hot summer, by evening it curdles. If you keep the dough in similar circumstances it ferments and soon starts giving foul smell. But nothing happens to bread or potatoes or apples or pulses. Bread will show signs of decay in probably 2-3 days times and potatoes and apples with take even longer. Pulses usually do not show any damage for months.

Thus, you can use three different terms to describe perishability of food. These are perishable, semi-perishable and non-perishable. The terms are relative meaning thereby, that all foods are perishable but some perish much sooner than the others. You must know that each food stuff has a specific period after which it begins to spoil. This period is called **shelf life**. Depending upon the shelf life we can divide foods into three categories:

7.1.1 Classification of food on the basis of perishability

Can you now classify all food items into categories of perishability? Try. The three categories of food are:

(i) Perishable foods: Cannot be stored for more than one or two days at room temperature, that is, they have a shelf life of 1 or 2 days. Milk is a good example of perishable food.

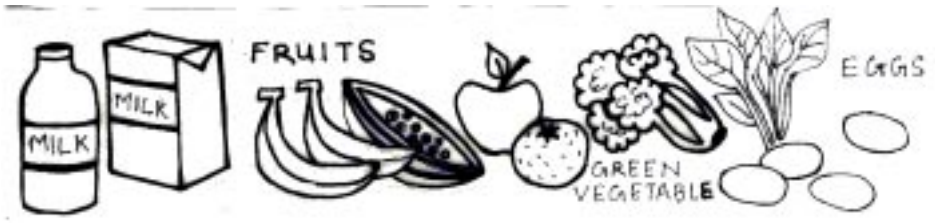


Fig. 7.1 Perishable foods

(ii) Semi-perishable foods: Can be kept for a couple of weeks or even a month or two. They have a longer shelf life than perishable foods. Potato, arbi, onions, ginger, biscuits and namkeens, are some examples of semi-perishable food.

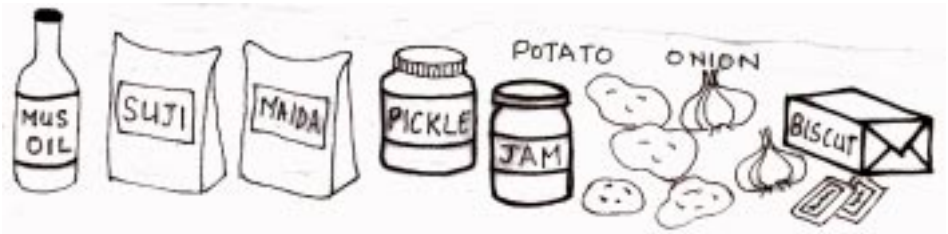


Fig. 7.2 Semi-perishable foods

(iii) Non-perishable foods: In the real sense, foods in this category are not really non—perishables, but they can be stored for much longer time as compared to perishables and semi-perishables. They can be stored for several months and the examples of such foods are cereals, pulses, dry fruits, spices, oil etc.

Fig. 7.3 Non-perishable foods

You can also change a perishable foodstuff to a semi-perishable or non-perishable one by giving it some treatment. For example, if you boil milk and refrigerate it you can keep it for few days. If you make a murabba from carrot, then you can keep it for months.

- **Perishable foods can be stored for 1-2 days.**
- **Semi-perishable foods can be stored for some weeks to 1-2 months.**
- **Non-perishable foods can be stored longer as compared to perishables and semi-perishables.**

INTEXT QUESTIONS 7.1

1. Classify the following foods as perishable (P), semi-perishable (SP) and non-perishable (NP).

1.	Bhindi	.....	2.	Urad dal	.....
3.	Suji	.....	4.	Besan	.....
5.	Jaggery	.....	6.	Wheat	.....
7.	Milk	.....	8.	Banana	.....
9.	Rice	.....	10.	Tomatoes	.....
11.	Apples	.....	12.	Pappad	.....
13.	Moong dal	.....	14.	Sugar	.....
15.	Cooking oil	.....	16	Wheat flour	.....
17.	Green peas	.....	18.	Spinach	.....

7.2 QUALITY INDICATORS

When you purchase anything from the market your aim is get your money's worth. How do you justify that? Well, in the process of selection you are

looking for certain qualities and if you find them in the product your decision is made. Some of these indicators are common for all food items. For example, freshness, natural colour, smell and cleanliness are some of the common indicators. Besides these are some specific indicators for example, green leafy vegetables need to be fresh and crisp while paneer needs to fresh and soft and bread has to be fresh and spongy.

It will be a good idea if you can devote some time to work out atleast 5-10 quality indicators for all food items or groups of food items. You can apply this knowledge to the selection and purchase of these items whenever need be.

Activity 7.1: Work out quality indicators for fruits and vegetables, milk and milk products, meat, fish, poultry and eggs, butter and oils Pulses and cereals

S.No	*Fruits*	*Indicators*
1.	Banana	(i) should be soft but firm (ii) should have clear and undamaged skin
2.		
3.		

Study the given example and select at least one food item of your choice from each category and write the indicators.

7.3 SELECTION, PURCHASE AND STORAGE OF FOOD

What do you do when you go to the market to buy food? You probably quickly run your fingers through wheat, rice, dal, etc., you press a tomato, mango or banana gently to see if it is firm. Why do you do this? You do this to assess the quality of food item. You generally buy more than what you need or what you can consume immediately. Buying food that spoils before you could use it, would mean wastage of money.

The food that you purchased could also spoil if it is not stored properly. This again would mean wastage of food and money. If you leave dals or spices in paper bags, they will absorb moisture and then after sometime fungus and small insects will grow on them. Biscuits would become soggy and loose namkeens would lose their freshness. This means that proper storage of foodstuff is as important as the purchase of quality foodstuff. Let us now learn what we must keep in mind while selecting and purchasing food and the methods of storing different foodstuff. Table 7.1 will enlighten you about the selection, purchase and storage of commonly consumed food items in any household.

Table 7.1 : Selection, purchase and storage of food

TYPE OF FOOD	NAME OF FOOD	SELECTION	PURCHASE	STORAGE
A. Non-Perishable Foods	1. Cereals and pulses, e.g. wheat, rice etc.	1. Should be clean i.e., without any stones, bits of stalk or rotting grains. 2. Should not have any lumps or webs which are formed because of insects and weavils. 3. Grains should be big, hard and dry. 4. Should have proper colour and appearance.	1. Buy from co-operative stores as they are cheaper and reliable. 2. Buy when in season, e.g. wheat in April/May, as it is fresh and has good flavour. 3. Buy in bulk if you have space to store.	1. Store in clean, dry and air-tight containers. 2. Lumps of salt and turmeric can be used for storing rice. 3. Mix wheat with dry neem leaves. 4. Special Ayurvedic tablets can be used. Tie these in muslin cloth so that it becomes easy to remove before cooking.
	2. Sugar, jaggery, tea coffee, salt	1. Should be clean and free of dirt, dust and stalk. 2. Should have proper colour. 3. Sugar should be dry: 4. Select only packed iodized salt, tea and coffee.	1. Buy more quantity only when good, clean variety is available. 2. Buy tea, coffee in small amounts only. They absorb mositure and loose flavour easily.	1. Store in clean, dry air-tight containers. 2. Tea should be stored in dark place.
B. Semi-Perishable foods	1. Suji, atta, maida, dalia etc. 2. Spices	1. Should not have lumps or weavils. 2. Should have proper colour and flavour 3. Should be finely powdered. 4. Packets must have standardisation marks.	1. Buy limited quantities only. 2. Should have a sweetish taste. 3. Spices should be in sealed packets and have standardisation mark. Packet should have recent date of packing.	1. Dry roast suji and dalia before storing. 2. Store in dry, air-tight tins or bottles so that flavour is retained for longer period.
	3. Ghee, oils, butter	1. Should not have a stale smell. 2. Should have proper colour. 3. Buy standard brands only.	1. Never purchase loose ghee/oil as it may be adulterated. 2. Buy according to family needs. 3. Buy brands with standardisation marks. 4. Check date of expiry	1. Store in air-tight containers. 2. Never leave the tin open as air and moisture make the ghee/oil rancid.
	4. Cheese and paneer	1. Paneer should be fresh and spongy. 2. Should not have a foul smell 3. Should not be shimy nor feel slippry on touch.	1. Purchase from a reliable shop.	1. Lightly fry paneer pieces and store on cooling. This way, paneer lasts much longer. 2. Fresh paneer can be kept in cold water or in the refrigerator for a day or two.

TYPE OF FOOD	NAME OF FOOD	SELECTION	PURCHASE	STORAGE
	5. Potatoes, onion. ginger, garlic	1. Select medium sized vegetable, with no sprouting eyes. 2. Onion covering should be dry and free of smell. 3. Ginger should be fairly big and dry.	1. Avoid buying green potatoes as they are not good in taste and are harmful.	1. Remove from packets and store onions and potatoes in separate wire baskets. 2. Keep ginger in wet sand to make it last longer.
	6. Processed foods, instant foods, jams, jellies pickles, papads, chutney, etc.	1. These should not be in bulging tins/ bottles, and bottle caps should not be broken. 2. Tins/tetrapacks should not be damaged or lacking.	1. Check label for FPO, brand names, and expiry date. 2. Check packet for damage and weight	1. Store in dry, cool and dark place. 2. Never leave tins and bottles open. 3. Transfer packet or open tin contents into clean air-tight bottles.
C. Perishable Foods	1. Fruits and Vegetables	1. Should be clean, fresh, firm and crisp. 2. Heavier fruits with a thin skin are juicier and of good quality.	1. Purchase only as much as required for the family.	1. Store in a cool, dry place. 2. Keep cauliflower and radish with leaves which keeps them fresh longer. 3. Keep leafy vegetables wrapped in a moist cloth. 4. Coat lemons with oil before storing. 5. Do not wash fruits before storing as they spoil faster. 6. Keep cabbage and cucumber in 2-3 folds of newspaper or brown paper.
	2. Eggs	1. Select eggs that are clean, fresh and large. Check freshness of eggs by - rough shell - no sound when shaken	1. Buy eggs from poultry farm if it is close by, as rates are lower.	1. Never wash eggs before storing. 2. Store eggs with pointed ends downwards. 3. Store in a cool place or in a basket in an airy room.

TYPE OF FOOD	NAME OF FOOD	SELECTION	PURCHASE	STORAGE
	3. Milk. Curd, Cream, Khoa	1. Select milk according to quality needed. - Toned milk (no cream) - Full cream (buffalo milk) 2. Check colour and taste. Milk has a sightly sweet taste. Stale milk has sour taste and an unpleasant smell.	1. Buy from clean and hygienic place.	1. Boil milk and keep in a cool place. If there is no refrigerator, boil milk after every 5-6 hours to keep it free from germs. 2. Never mix old milk with fresh milk. 3. Curd and cream should be stored in cool place, a refrigerator, if possible. 4. Keep away trom strong smelling foods e.g., onions, guava, mango etc., as it absorbs the smell. 5. Khoa is soft and sweet but becomes sour if not stored in a cool place.
	4. Meat. Fish, Chicken	1. Fresh meat is always pink in colour. 2. Meat should be firm, yet soft and have a smooth surface. 3. Should not have a rotten smell. 4. Meat and fish should not feel sticky. 5. Fish gills should be bright red in colour. 6. Press fish with thumb and if depression remains, the fish is not fresh.	1. Buy from reliable shops only, where meat of healthy animals is sold. 2. Buy in required quantity only and consume immediately.	1. Keep in cool place.
	5. Bread	1. Press it between your fingers. If soft to touch and presses easily and comes back to original shape, it is fresh.	1. Buy from a reliable shop. 2. Buy just enough to last 1-2 days only.	1. Keep in air-tight containers so that it remains fresh longer and in cool place or refrigerator.

- **Knowledge of what, where and when to buy helps you to get quality foods.**
- **Knowledge of how to store foodstuffs helps to prevent spoilage.**

Activity 7.2: Go to your neighbourhood market to buy vegetables for dinner. Recall and list the points that you kept in mind while selecting the vegetables.

Activity 7.3: You have bought paneer, rice and eggs to be used after two days . Note down the procedure for storing each of them.

Note: Use the following tables to record your information.

Food items	Criteria for selection
1. 2. 3. 4. 5.	

INTEXT QUESTIONS 7.2

1. Define the following terms
   (i) perishable.....
   (ii) semi-perishable.....
   (iii) non-perishable.....
2. Mention common quality indicators for the perishable, semi perishable and non-perishable food items.
   .....

7.4 FOOD SPOILAGE: CAUSES AND HAZARDS

What happens when suji, dal, etc., are left in open for a few days? You will see that the insects have grown on them. This happens because they are not stored properly. Similarly, what happens when cooked dal or vegetables are left outside the refrigerator for two days? A white cottony layer can be seen on top of the dal. There is also a very unpleasant smell. Can you eat this dal? No. This dal is not fit for human consumption. It is spoilt.

Food spoilage occurs when the quality of food is damaged, hence it becomes unfit for human consumption.

Foods can be spoilt by

- Micro-organisms
- Enzymes
- Insects and rodents

1. **Micro Organisms:** Do you remember the example of dal which was kept outside for two days and which got spoilt? How did it go bad? What causes this spoilage? The dal has been spoilt by micro-organisms which are present in the atmosphere all the time. They settle on the outer layer of foods and produce certain chemicals leading to spoilage of food. If this food is consumed it may lead to harmful effects. Microorganisms can be in anyone of these forms: bacteria, yeasts or moulds.

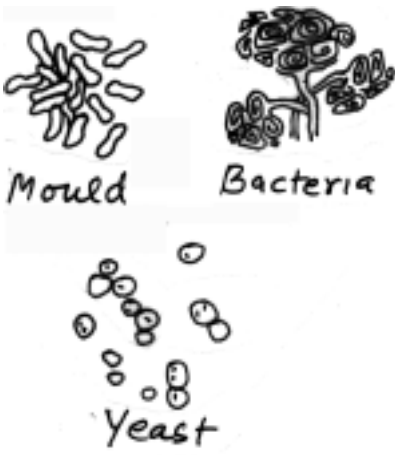


Fig. 7.4 : Microorganisms under the microscope

Some micro-organisms are beneficial also. For example, how do you prepare curd at home? You just add some old curd into warm milk and after a few hours the curd is set. How did this happen? This change of milk to curd also takes place by the action of micro-organisms called bacteria. Formation of spongy texture in idli, dhokla, dosa, bread, etc., is also due to the action of micro-organisms like yeast. Remember, such action of micro organsims is not spoilage of food.

Micro-organisms are tiny living creatures which are present everywhere all the time. They cannot be seen with naked eyes.

2. **Enzymes:** Do this experiment: Keep a raw mango in the kitchen for a few days.

Observe the changes in the mango:

Colour - The mango changes its colour from green → yellow → brown

Texture - It changes from hard → firm → soft

Flavour - changes from sweet → offensive.

Mango at this stage becomes unfit for eating. Can you say why these changes take place in the raw mango? This is due to the continuous action of enzymes present in the mango. Such enzymes are present in every foodstuff. Actually, these enzymes are responsible for the growth of food and hence ripening of the fruit. If food is stored properly, action of enzymes can be delayed and food can be protected from food decay.

Enzymes are chemical which are already present in foods and help in the repening of foodstuffs.

3. **Insects and Rodents:** Leave dal, rice, wheat outside for a few days. What happens, if grains are not stored properly. They can be easily attacked by insects and rodents. They spoil food, not only by eating

Rodents are nibbling animals and include mice, squirrel and rats.

the food but also by dropping their excreta. Such foods are totally unfit for human consumption and get wasted.

Besides, there are other factors which speed up the process of food spoilage. These are heat, moisture and air which help in speeding the growth of micro-organisms which spoil the food. You must have noticed that cooked food spoils faster in summer than in winter. This is because of the presence of heat and moisture in the air. You can keep dry food safely for a very long time because there is no moisture in them and therefore microorganisms cannot work on it.

Food that gets spoilt is not fit for human consumption. There is a change in the quality of the foodstuff. If this food is consumed it could lead to health hazards like nausea and vomiting, diarrhoea and stomachaches.

INTEXT QUESTIONS 7.3

1. Rice can be kept for a long time since its moisture content is:
   (a) high
   (b) medium
   (c) low

   because .....

2. Bacteria is a/an
   (a) enzyme
   (b) rodent
   (c) micro-organism.

   because .....

3. Fruits and vegetables remain fresh if the temperature is
   (a) warm
   (b) cool
   (c) hot

   because.....

7.5 SAFE HANDLING OF FOOD

Safe handling of food means hygienic handling of food and it is required for food safety as well as for those who consume it. Unsafe food carries germs which can cause diseases. Hence, food meant for human consumption should be handled safely so as to prevent any harmful effects.

Remember the following points while handling food:

- Wash your hands before cooking and eating.

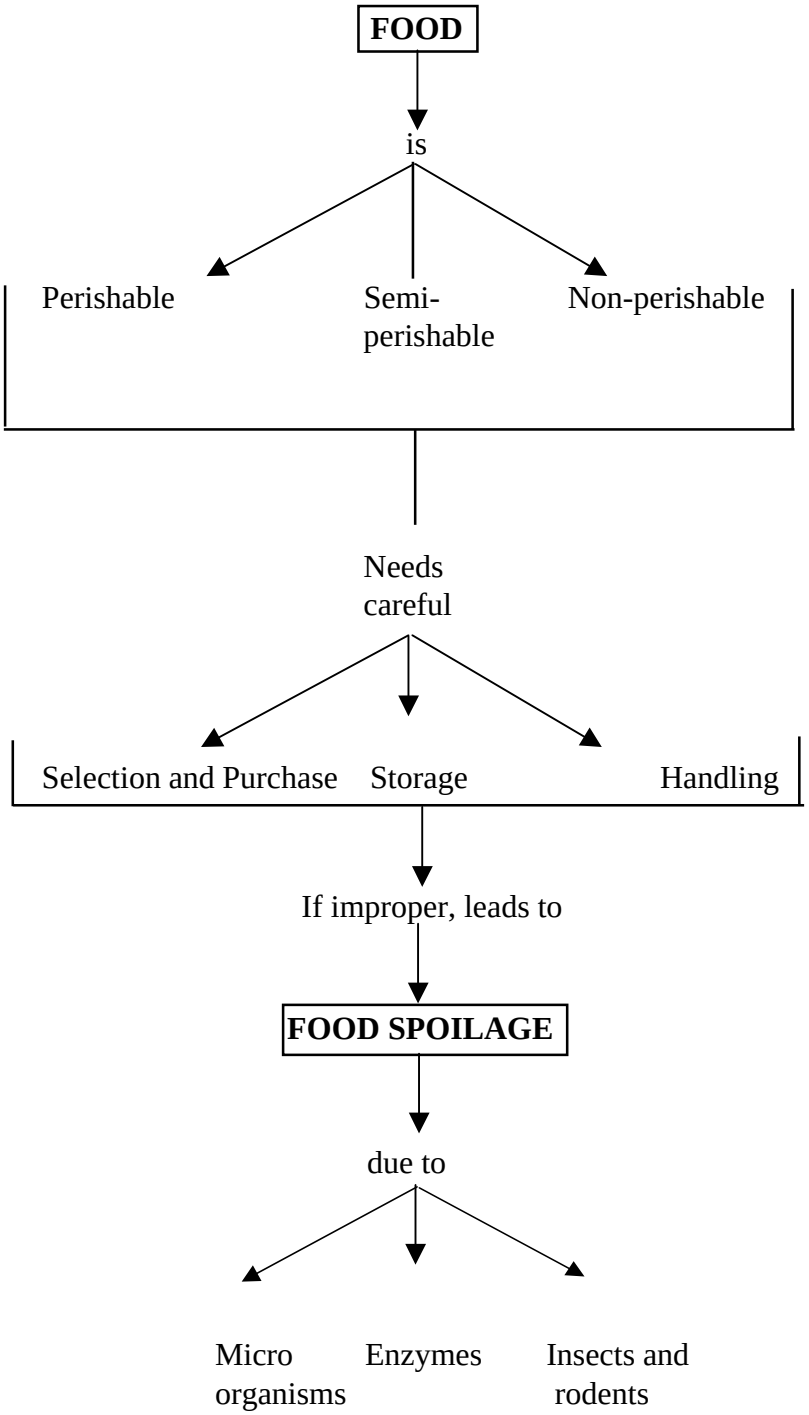
- Wash all fruits and vegetables before cooking or eating them raw.
- While coughing or sneezing, cover your mouth and nose.
- While tasting, use a separate spoon and do not put this spoon back in the food.
- Keep all perishable foods in a cool place or in a refrigerator.
- Use perishable foods at the earliest.
- Keep your kitchen and storage facilities clean.
- Use clean utensils.
- Buy food especially, milk and milk products, meat products, etc., from reliable sources.
- Ensure quality while buying.

INTEXT QUESTIONS 7.4

Select the correct answer:

1. Before storing, green leafy vegetables should be wrapped in
   (a) brown paper
   (b) moist muslin cloth
   (c) newspaper
   (d) polythene packet
2. Eggs should be stored with pointed ends
   (a) straight
   (b) downwards
   (c) upwards
   (d) angled
3. Rice can be stored using
   (a) neem leaves
   (b) special ayurvedic tablets
   (c) lumps of salt and turmeric
   (d) all of the above
4. Perishable food items can be stored in refrigerator for
   (a) one day
   (b) a week
   (c) limited time
   (d) unlimited time.

WHAT YOU HAVE LEARNT



TERMINAL EXERCISE

1. Give three examples each of perishable, semi-perishable and non-perishable foods.
2. List two points we must keep in mind while selecting the following foods:

   (a) rice (b) vegetables
   (c) bread (d) meat
   (e) maida (f) canned food
3. What are the main causes of food spoilage and factors speeding them?

ANSWERS TO INTEXT QUESTIONS

7.1	**Perishable**	**Semi-perishable**	**Non-perishable**
	Bhindi	Suji	Urad dal
	Banana	Besan	Wheat
	Tomatoes	Jaggery	Rice
	Apples	Moong dal	Sugar
	Green Peas	Papad	
	Spinach	Cooking oil	
	Milk	Wheat flour	
7.2	(i) & (ii) Refer to text		
7.3	1 (c)	2. (c)	3. (b)
7.4	1 (b)	2. (b)	3. (d) 4. (c)

TERMINAL EXERCISE

1)	Perishable	Semi-perishable	Non-perishable
	Milk	Jaggery	Rice
	Banana	besan	sugar
	Cooked dal	oil	dry spices

2) Refer Table 7.1

3) Three causes - Micro organisms, enzymes, insects and rodents. Factors speeding them - heat, moisture and air.

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8

PREPARATION OF FOOD

We all cook food at home. We enjoy eating food that is cooked in different ways. Take a food item like wheat flour. What will happen if we eat only 'chappatis' made out of it? We will get bored of eating the monotonous food everyday.

So, variety is brought into the food by preparing 'parantha' or 'puri' from the wheat flour. Similarly, a meal is prepared by using different methods of cooking. For example, a menu of dal, rice, puri and kheer involve a different method of cooking them. This way, cooking helps us in making meals interesting.

A food item goes through various stages of preparation before it is cooked. If we go wrong in these steps of cooking the final product will not be as expected. Thus, food preparation is not only an art but a science too. In this lesson, you will learn to use various methods of pre-preparation and preparation of food and also learn about the changes that occur in the food during its preparation.

OBJECTIVES

After reading this lesson, you will be able to:

- explain the meaning and importance of pre-preparation and preparation of food;
- list and discuss the salient features of four major methods of cooking;

- relate nutrient loss to method of pre preparation and cooking;
- suggest ways of enhancing nutritive value of food.

8.1 NEED FOR COOKING

We all like to eat cooked food. Have you ever thought why food should be cooked and then eaten? Here are some reasons for cooking food before it is eaten.

- Food becomes tender, soft and easier to chew and digest
- Heat destroys harmful micro-organisms making the food safe and sterile
- Cooking improves the appearance and enhances the flavour of many foods
- Digestibility of starchy foods is enhanced through release of starch from cereal grains
- Through cooking you can create variety in your meals.

8.2 PRE-PREPARATION OF FOOD

Let us see what goes into making the dishes different and tasty from one another. We can acheive varied effects in the foods by performing different activities on them. For example, a washed carrot or cucumber is tasty to eat, but a washed, peeled and sliced carrot or cucumber sprinkled with salt-lemon will taste even better. You can cook potatoes whole, with their skin on or after peeling and cutting them into pieces. Here, the activities like washing, peeling, slicing are examples of pre-preparation.

Activities by which food becomes ready to be cooked is called pre-preparation.

Some of the pre-preparation activities are as follow:-

- Blanching - Removing skin by putting food in boiling water and then in cold water.

Fig. 8.1 : Washing

- Washing - Cleaning food with water.

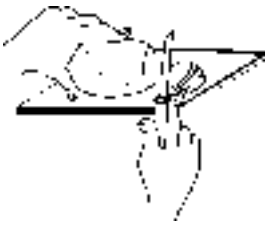


Fig. 8.2 : Cutting

- Cutting - Pass a knife through in order to produce pieces.

- Peeling - Remove skin using a knife/peeler.
- Mashing - Breaking a soft food into a paste.

Fig. 8.3 : Peeling

Fig. 8.4 : Grating

- Grating - Breaking food in very small pieces using a grater.
  Shredding - Cutting food into very fine pieces.
- Grinding - Breaking food into powder/paste using grinder.
- Steeping - Soaking food in liquid.
- Sieving - Separating/removing larger pieces from small ones.

Fig. 8.5 : Grinding

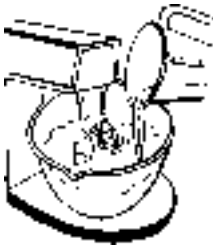


Fig. 8.6 : Mixing

- Mixing - Putting different foods together.

It will be fun to find out about more such terms used for pre-preparation of food and defining them.

Each food item requires different pre-preparation activities depending upon its end-use. For example, coriander leaves undergo different activities for different end uses.

For Green Garnish - Coriander is plucked, cleaned, washed and chopped finely;

For Chutney - Plucked, washed and ground to a fine paste.

Similarly, for making chips, potato needs to be: Washed → peeled → thinly sliced.

For making tikki, potato needs to be: Washed → boiled → peeled → mashed

Activity 8.1: Observe your mother in the kitchen and list the activities she performs on the following before cooking them:

Sl.No.	Channa Dal	Cauliflower	Spinach
1.			
2.			
3.			
4.			
5.			
6.			

8.3 PREPARATION OF FOOD

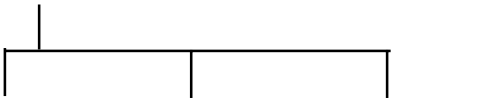
After undergoing the various pre-preparation activities, the food is ready to be cooked.

Once the food has undergone prepreparation, the process of subjecting it to the action of heat is termed as cooking.

There are many methods of cooking i.e., applying heat to the food. You may observe that the manner in which heat is applied to the food determines the type of cooking method used. Here is our list of various methods of cooking.

Methods of Cooking

A) Moist Heat	**B) Dry Heat**	**C) With fats**
1. Boiling	1. Grilling	1. Deep frying
2. Simmering	2. Roasting	2. Shallow frying
3. Poaching	3. Baking	3. Sauteing
4. Stewing	4. Puffing	4. Dry frying
5. Steaming		



D) Microwave cooking **E) Solar Cooking**

Now, you must know the special points about each method because these will help you to decide which method to select for cooking a particular food or to get a specific result.

A. Moist heat

1. **Boiling** - Food is immersed in sufficient amount of hot water and heated to its boiling temperature (100^0C or 212^0F) The temperature is maintained till the food is cooked. For example while boiling potato you see that hard potato becomes soft when you allow it to boil for some time. You can boil almost any food which is hard/tough to make it soft.

Points to remember

- Boil food along with their skin to minimize losses of nutrients
- Boil in covered utensils to minimize losses due to evaporation
- Avoid excessive boiling because it can disintegrate the food.

2. **Simmering** - Food is cooked in water as the medium and providing heat below boiling temperature, that is, 95^0-98^0F. For example, Kadhi and kheer are prepared by this method. Since the heat is low you do not need too much water.

Points to remember

- Do not bring the food to boiling temperature
- Do not cover the food while cooking, so that the temperature does not rise.

3. **Poaching** - Cook the food in minimum amount of liquid at temperature just below the boiling point.

   It is used for cooking fish, eggs and fruits because these food do not require long cooking. Add a pinch of salt and few drops of vinegar to cooking liquid for a clean smooth edge while making poached egg.

4. **Stewing** - It is a gentle method of cooking in a pan with a lid. Food is simmered (98^0C) in small amount of liquid. Steam generated in the pan helps in cooking and softening the food.

Fig. 8.7 : Stewing

Points to remember - A stew boiled is a stew spoilt! It is used in cooking less tender cuts of meat, vegetables, fruits, eg., - apple, peach.

5. **Steaming** - The steam generated by water is used as a medium of cooking. Food does not come in direct contact with water.

It is achieved through following three methods.

Direct Method

Food is kept in the sieve or muslin cloth on top of the pan containing hot boiling water. The steam generated from water in the pan. cooks the food. Special steamers are also available. Used for peas, idli, fish and soft vegetables

Fig. 8.7(a)

Indirect

Food is placed in smaller closed container in the pan containing boiling water. The heat of steam surrounding the smaller container cooks the food.

Fig. 8.7(b)

Pressure Cooking

It is based on the principle that more heat is generated under pressure than otherwise, thereby reducing the cooking time.

Fig. 8.7(c)

Pressure cooking is one of the ideal methods due to its shorter cooking time, better nutrient retention and palatability. It also economizes on fuel, time and effort.

Points to remember

- Do not overfill the pressure cooker. Fill only upto two-third of the volume.
- Take care of rubber gasket, vent pipe and the safety valve. Change immediately, if damaged.
- Lower the flame on the first whistle.
- Do not try to open the lid immediately after removing from fire.

INTEXT QUESTIONS 8.1

1. Give one similarity and one differene between

   i) Stewing and Simmering.....
   .....

   ii) Peeling and Blanching.....
   .....

   iii) Shredding and Grating.....
   .....

   iv) Grinding and Mashing.....
   .....

Notes

2. Give five reasons for cooking.

.....

.....

.....

B. Dry Heat Methods

Chappatis, breads, biscuits, etc., are an integral part of our daily diet. These food items and many more are cooked by hot air. Some of the techniques of cooking with hot air/dry heat are as follows.

1. Roasting

Food is brought in contact with direct heat of the flame or any other source of radiant heat. Food is periodically coated with fat and turned around for uniform cooking. Roasting imparts a characteristic brown colour and flavour to food. Chappatis, various vegetables and mutton or chicken kebabs are prepared by roasting.

Roasting is of three types

Spit	**Oven**	**Pan/pot**
(for kebabs) and meat, corn, brinjal	(large cuts of meat and full bird like chicken, turkey, etc)	root vegetables-potato, sweet potato, peanuts popcorns

2. Grilling or Broiling

The food is placed on a metal grid directly above the source of heat or a tray placed under the source of heat. Electric grills and hot plates are available. You can prepare pizzas, cheese toasts, chips, grilled tomato, capsicum, sandwich, etc.

Fig. 8.8: Grilling

3. Baking

This method combines the action of dry heat with that of steam which is generated while the food is cooked. It involves use of oven or tandoor. Baked foods are crisp, brown on top, soft and porous inside.

Cakes, breads, biscuits, puddings some vegetables and meat dishes are cooked using this method.

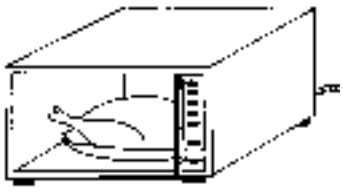


Fig. 8.9: Baking

4. Toasting

Bread slices are kept in a grill between two heating elements and browned on both the sides. Automatic toasters are also available which prevent burning or blackening of the bread. The toaster shuts off when toast is done.

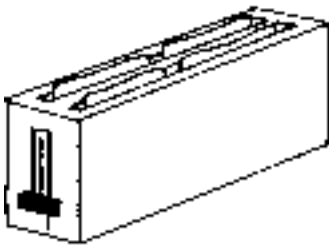


Fig. 8.10: Toasting

INTEXT QUESTIONS 8.2

8.2 1. Name the method of cooking the following:

i) Seekh Kabab .....

ii) Biscuits and cakes .....

iii) Brown toast .....

iv) Popcorns .....

2. State whether following statements are true and false.

(i) Grilling is a method of cooking by dry heat. T/F

(ii) Steaming food is possible only by direct method. T/F

(iii) While baking, food is cooked with the help of hot air. T/F

(iv) For boiling food, water must boil all the time. T/F

(v) Simmering is done at low temperature. T/F

(vi) Toasting means browning the food from all sides. T/F

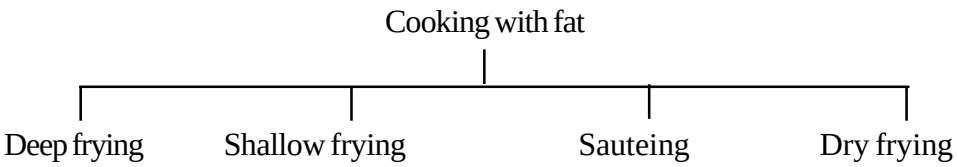
(vii) When food is cooked on direct flame it is called roasting. T/F

C. Cooking with fat

We all like to eat samosas, pakoras and paranthas. What method of cooking is employed in cooking them? Yes, frying. What do you mean by frying? When food is cooked in sufficient quantity of fat, it is called frying.

Cooking the food by partially or fully immersing in hot fat till brown is called frying.

This method can broadly be classified into four categories :



1. **Deep frying -** Food is immersed in hot fat in 'Kadhai' or a deep fryer (with wire net) till it is golden brown. Special "Ladles or Poune" are used to drain out excess fat once the food is cooked. Tasty samosas, fish, chips, cutlets, puris are all 'deep fried'.

   Deep frying is useful for bulk cooking, saves time, effort and fuel. It also conserves more nutrients as compared to other frying techniques.

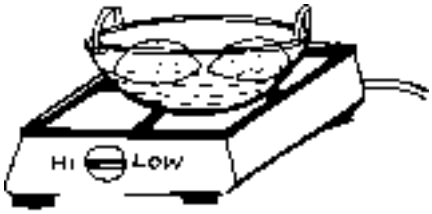


Fig. 8.11: Deep Frying

Points to remember

- Do not fill the 'kadhai' more than two-third of its volume
- Reduce the flame immediately if oil starts smoking
- Turn the food gently to prevent splashing of hot oil
- Drain all the excess oil from the food after frying
- Don't over-fry the food
- Repeated use of same oil is not good for health.

2. **Shallow Frying -** In this method, food is cooked in a flat vessel like frying-pan or 'Tava'. The food is partially immersed or has only surface contact with oil or fat.

   Dosa, paranthas, cheela, omelette and tikki, etc., are all shallow fried.

3. **Sauteing -** It involves use of just minimum fat to cover the base of the pan. The food is tossed occasionally to cook evenly. Very little amount of heat is applied to the pan and food gets cooked in its own steam.

   Vegetables, mushrooms and noodles are sauted. It is a healthy cooking method which retains the nutrients and flavours of the food.

4. Dry Frying - It is used for food having sufficient fat of their own. On application of dry heat, oil melts out and cooks the food.

Bacon, sausages, paneer made from full cream (tikka) are cooked through this method.

Fig. 8.12: Dry Frying

D. Microwave cooking - It is a fairly recent method of cooking. It involves use of high frequency electromagnetic rays (microwaves) which penetrate into the food. These produce the frictional heat by setting up vibration within the food.

Cooking is done in special ovens called Microwave oven.

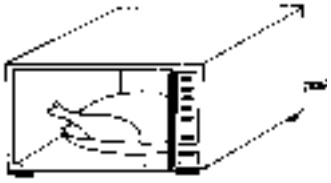


Fig. 8.13: Microwave Cooking

It is a quick method of cooking and reheating the food. Food does not turn brown and also retains its original colour. It is used in fast food shops for quick service.

E. Solar Cooking

Solar energy is the primary source of most energy available on earth. Use of this method has come up as an alternative fuel source for cooking.

Solar cooking is based on the principle that black surface and background absorb solar rays and get heated. Food kept in the black boxes are cooked with this heat.

Fig. 8.14: Solar Cooking

It is used for making dals, boiled rice and vegetables, breads and biscuits.

The maximum temperature it attains is around 100^0F and hence cannot be used to make chapattis and for roasting.

INTEXT QUESTIONS 8.3

1. Fill in the blanks in the following statements.

   i) When food is cooked between two heated elements the procedure is called _____.

ii) When food is cooked in a hot chamber it is called _____.

iii) When food is cooked by dipping it in hot water it is called _____.

iv) When food is cooked by dipping in hot oil it is called _____.

v) When food is cooked by touching the hot greased pan the process is called _____.

vi) When food is cooked with hot vapour it is called _____.

vii) When food is cooked on hot flame it is called _____.

viii) When food is cooked by placing it in hot sand/ash it is called _____.

ix) When food cooked by placing it in the hot sun it is called _____.

x) When food is cooked in sealed container the process is called _____.

2. Differentiate between deep frying/shallow frying.

_____

_____

3. Which method of cooking does a vendor use to prepare a plate of tasty noodles?

_____

_____

4. List the precautions we need to take while frying food.

_____

_____

5. Tick the correct answer:

(i) Microwave cooking uses high frequency

a) Electromagnetic rays
b) Electric rays
c) Infrared rays
d) Ultraviolet rays

(ii) In solar cooking, food is kept in a box which is

a) Red
b) Black
c) White
d) Yellow

8.4 LOSS OF NUTRIENTS

All of you are now familiar with various methods of cooking. All these are aimed at making the food not only tasty, palatable but also nutritious. But unfortunately during all the stages of pre-preparation and preparation of food, there are losses of nutrients to some extent. Some of these losses can be prevented and with the help of certain practices the nutrition in food can be enhanced during pre-preparation and cooking. Let us see what these practices are.

- **For vegetables :**
  - Wash ***before*** peeling and cutting. Water soluble vitamins and minerals will not be lost.
  - Do not peel and cut the vegetables long before cooking
  - Cut vegetables into large pieces, to save nutrients.
  - Cook the vegetables in minimum amount of water or utilize the excess water in soups, dals and curries.
  - Cook the vegetables till tender, do not overcook.
  - Green leafy vegetables can be cooked without water as they already contain lot of water.
  - Use some vegetables in raw form as salad daily.
  - Vitamin C can be best conserved by cooking covered for a very short period.
- **For fruits:**
  - Cut just before eating
  - Consume in the natural form
  - Wash and consume apples, chikkoo and do not remove the skin
- **Cereals and pulses:**
  - Do not sieve atta as all the bran (chokar) will be lost. Bran or chokar is rich in B complex vitamins.
  - Avoid repeated, prolonged washing of rice and dal avoid. It prevents loss of vitamin B complex.
  - Wash and soak dals and rice. Use the soaking water for cooking to save water soluble vitamins and minerals.
  - Avoid use of cooking soda to preserve nutrients.
  - Cook for the shortest possible time in minimum amount of water.

Steaming under pressure (pressure cooking) cooks fast and conserves nutrients.

- **Milk:**

Repeated boilings and exposure to sunlight destroys the essential nutrients present in milk.

INTEXT QUESTIONS 8.4

Q1. Tick (√) the correct answer:

(i) Green leafy vegetables lose (Vitamin C/Iron) while cooking

(ii) (Peel/wash) the potatoes before boiling

(iii) Cooking in (open pan/closed pan) saves nutrients.

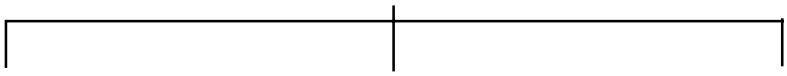
(iv) (Use/throw) the water used for soaking the rice.

(v) Cut the vegetables into (big/very small) pieces to save nutrients.

8.5 EFFECT OF HEAT ON COOKING

On being subjected to heat foods undergo certain changes, which may be external changes or internal or both. Let us see what changes externally and how you can recognise these changes.

External Changes



Colour Flavour/Odour Texture

- **Change in colour:** This change is visual and you can see it. Generally you will notice that vegetables become darker in colour when heat is applied. But when they are overcooked the colour changes for example, green vegetables changes to a darker brown colour, carrots cooked in milk, imparts pink colour to milk, similarly you will see red meat turns brownish red.
- **Change in flavour:** You can smell this change. Sometimes it is all over the house. Pungent smell of fish and other non-vegetarian foods decrease on cooking. Zeera, clove, hing, etc., acquire a special smell on roasting.
- **Change in texture:** This change is best known when eaten but you can also feel it on touching the food or even visually. Cereals and pulses, root vegetables become soft on boiling. Similarly meats become soft and tender and egg coagulates on cooking to give a soft solid.

Internal Changes

Food undergoes some internal changes as well and these changes are in terms of the nutrients.

1. **Carbohydrates -** They absorb water and swell up in the presence of moist heat. Over cooking results in the bursting of carbohydrate molecules and makes the food pasty and sticky.
2. **Proteins -** These coagulate on heating and become tender. Prolonged cooking results in their shriveling and hardening.
3. **Fats -** At optimum cooking temperature, fats do not change. However, on extensive heating, start to disintegrate into fatty acids and glycerol.
4. **Minerals -** Normally they do not change. However, if excessive water is used for cooking and then discarded, a lot of minerals leach into the cooking water.
5. **Vitamins -** Need special mention specially water soluble ones, B-complex and vitamins C.
   - **Vitamin C -** In presence of light and on heating, it is easily oxidized and lost. It is better that fruits and vegetables, which contain vitamin C, are consumed in raw form.
   - **Vitamin B complex -** These are lost even during washing of foods. It is also lost due to leaching. Discarding the cooking water and addition of soda bicarbonate also leads to further losses.

Activity 8.2

Observe and list two changes when you cook dal, palak, rice.

8.6 ENHANCEMENT OF NUTRITIVE VALUE

Loss of nutrients during pre-preparation, preparation and cooking can be minimized. In fact, judicious use of certain methods can enhance the nutritive value of foods.

At the home level - It can be achieved through age old, time-tested methods of:

- Germination/Sprouting
- Fermentation
- Supplementation/Combination

At the manufacturing level

- Fortification - Vegetable oils with Vitamin A and D; salt with iodine.
- Enrichment - Processed food products

Let us discuss how we can enhance the nutrient content of our daily dishes

Methods	Foods Involved	Effect
1. Germination	Pulses - Moong, chana, moth beans, peas, whole grains, wheat grains.	– Increase in vitamin C and B-complex. – Bound iron becomes available to the body. – Easy to digest and – Easy to cook.
2. Fermentation It is a process by which some micro-organisms are added to the food to make them light and fluffy.	Dough - atta/maida, curd, cereal - pulse combination (dal+rice), beverages.	– Increase in B-complex vitamins and vitamin C. – Improves digestibility as carbohydrates, proteins are broken down into simple forms. – Imparts special taste – Increases the availability of iron, calcium.
3. Supplementation Process of combining foods from different food groups, thereby improving the nutritive value.	Cereals and pulses, cereals and milk. pulses and milk eg. kheera, halwa, khichdi, idli, dosa, etc. are few examples of combination.	Total nutritive value of dish is increased through the combination of ingredients

Note :

1. Fermentation and germination increase the nutritive value of food at no additional cost.
2. Combination/supplementation is the cost effective way to a well-balanced and healthy diet.

Activity 8.3

Germinate each of the following and measure their volumes after germination. Observe:

Volume before germination	*Volume after germination*
(1 teaspoon of channa) 1 teaspoon of whole moongdal 1 teaspoon of wheat grains 1 teaspoon of moth	

INTEXT QUESTIONS 8.5

1. Match the statements of Column A with those in Column B.

A	B
i) Cereal with milk	a. spinach khichri
ii) Cereal with dal	b. fruit custard

iii) Dal and vegetable
iv) Cereal with vegetable
v) Dal, cereal, vegetable.
vi) Milk with fruit

c. rice-kheer
d. dosa
e. paushtic namkeen dalia
f. vegetable cheela

2. Name the method of food enrichment used for–

i) A soft spongy dhokla _____
ii) Iodised salt _____
iii) Green sprout chat _____
iv) Vegetable khichdi _____

3. Name two changes brought by cooking in each of the following foods

i) Rice_____ ii) Fish_____
_____ _____
iii) Chappati (Wheat)_____ iv) Apple_____
_____ _____
_____ _____
v) Split moong dal on boiling
_____ _____
_____ _____

8.7 EFFECTIVE USE OF LEFT OVER FOOD

Cooked food is sometimes leftover after the meals. A lot of effort and money goes into food production. Hence, these foods should be reused effectively.

Some dishes which we all are familiar with and can be made by using the left over food are paranthas stuffed with dal, vegetable cultets, pao-bhaji, boiled rice kheer and many more.

Here are some other examples for you:

- Vegetables pulao can be mixed with potatoes and made into cutlets, koftas.
- Sour curd can be used for making 'kadhi'. It can be mixed with maida to make bhatura, curd rice, or lassi.
- Leftover tomato-onion salad can be used for making dry mixed vegetable, stuffed omlettes, soups and curries.
- Bread slices can be mixed with potatoes to make tikkis, cutlets etc.
- Left over green leafy vegetables can be kneeded in dough to make parathas or puris.

WHAT YOU HAVE LEARNT

FOOD

needs to be

PRE-PREPARED

by

– Shredding
– Steeping
– Sieving
– Mixing
– Grating
– Mashing

–Washing
–Cutting
–Blanching
–Peeling
–Grinding

before COOKING

by

Moist heat
- Boiling
- Simmering
- Poaching
- Stewing
- Steaming

Direct Indirect Pressure cooking

Dry heat
- Grilling
- Roasting
- Baking
- Puffing

With fats
- Deep frying
- Shallow frying
- Sauteing
- Dry frying

Microwave cooking

Solar cooking

PRESERVE NUTRIENTS → by effective use of principles of pre-preparation and preparation of food

HEATING FOOD brings about

EXTERNAL CHANGES
- Colour
- Flavour/Odour
- Texture

INTERNAL CHANGES on
- Carbohydrates
- Proteins
- Fats
- Minerals
- Vitamins

NUTRITIVE VALUE OF FOODS CAN BE ENHANCED

At home level
– Germination
– Fermentation
– Combination/Supplementation

At commercial level
– Fortification
– Enrichment

TERMINAL EXERCISE

1. Explain, giving examples, different methods of enhancing the nutritive value of food, both at home and at manufacturing level.
2. Giving suitable examples, write short notes on the following methods of cooking.
   i) Boiling
   ii) Stewing
   iii) Simmering
   iv) Steaming
3. List all the pre-preparation activities required for cooking the following food items.
   i) Palak Pakora
   ii) Mooli Paratha
   iii) Peas - Pulao.
4. List the ingredients of Samosa, explain different types of changes that occurs in each ingredient during the process of cooking.
5. What precautions will you take while making mixed vegetable pulao to avoid loss of nutrients.
6. Give at least five dishes, that can be made from left over food, other than the ones listed in the lesson.

ANSWERS TO INTEXT QUESTIONS

8.1 1. Stewing and simmering: Both cooked on slow fire/little water. Stew is covered and simmering is without lid.

2. Peeling – Removing skin with a knife
   Blanching – Removing skin by dipping in hot water and then in cold
3. Shredding and grating – Breaking food in very small pieces. Shredding is with knife, grating with grater.
4) Grinding and mashing – Breaking food to produce a paste
   Grinding is with a grinder, can also be for producing powder
   Mashing – Make food soft and then press to produce paste.

2. taste, safety, softening, variety, attractive and flavour

8.2 1. i) Spit Roasting ii) Baking iii) Toasting
iv) Pan/pot roasting

2. All statements are True

8.3 1. i) toasting ii) baking iii) boiling
iv) deep frying v) shallow frying vi) steaming
vii) grilling viii) roasting ix) solar cooking
x) pressure cooking

2 Refer text

3. Refer text

4. Refer text

5. i) a ii) b

8.4 i) Vitamin C ii) Wash iii) Closed pan
iv) Use v) Big

8.5 1. i) c ii) d iii) f
iv) e v) a vi) b

2. i) Fermentation ii) Fortification iii) Germination
iv) Combination/Supplementation.

3. i) soft and white/swells up. ii) soft, less smelly.
iii) colour - darker, texture - crisper, taste - sweeter.
iv) soft and darker v) soft and thick

AUDIO
Bhojan Pakane Ki Vidhiyan

VIDEO
Conservation of Nutrients.

For more information log on to
http://www.hindustanlink.com/recepiet/index(r),htm
http://sio.midco.net/poornima

9

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FOOD PRESERVATION

You are now familiar with perishability of food and importance of selection as well as storage of food to prevent its spoilage. Do you know how you can actually prevent food from getting spoilt? Yes, by preserving it. You must have seen it at your homes-potato wafers being dried, raw mango being cut and dried, tomato sauce, *chutneys, dal wadi* and *papads* being made.

Preserved food not only adds variety to our meals but also helps in utilising excess produce at harvest time. Let us learn more about food preservation in this lesson.

OBJECTIVES

After reading this lesson, you will be able to:

- define the term 'food preservation' and state its need;
- explain the basic principles of food preservation;
- list and describe household methods of food preservation;
- describe recipes for preservation of simple food items at home.

9.1 MEANING AND NEED FOR PRESERVATION

Food preservation is to treat food to keep it in good condition for a long time. Why do we do that?

Let us take a simple example of boiling milk. Why do we boil milk? So that we can use it for a longer period. You know that boiling delays milk from getting sour. You can say you have processed milk and preserved it, even if it is for a short duration.

Food preservation is a form of processing of food to prevent it from spoilage and making it possible to store in a fit condition for future use.

It may be as simple as boiling of milk or complicated like pickling of mango or lemon. By preserving foods, we are also increasing their shelf life. You already know what shelf life of food means. Yes, it means the time period for which a food can remain fit for human consumption at optimum temperature.

Activity 9.1: There are a lot of preserved foods available in the market. List five of them and state appoximate shelf life of each. Also, state if there are any instructions about keeping each. Can you state one reason for doing so?

Activity Table

Food item	Shelf life	Keeping instructions on label	Reason (Remark)
1.			
2.			
3.			
4.			
5.			

9.1.1 Need for preservation

- To increase the shelf 1ife of foods.
- To prepare new products like jams, papads, pickles, etc. Such products are enjoyed by everyone and all the year round.
- Processing reduces the bulk of fruits and vegetables. The storage and transportation becomes easier, e.g., 1 kg of carrots wouId take more space than 1 kg of carrot *murraba*.
- Helps in ulilizing the food stuffs when available in excess.

9.2 PRINCIPLES OF FOOD PRESERVATION

You have learnt earlier that by boiling milk we are preserving it for a longer time. But, what are you actually doing by boiling? You are killing the micro-organisms by raising the temperature of milk. Micro-organisms cannot survive at very high temperature. This is one of the principles of food preservation. Let us now learn about the principles of food preservation:

1. By killing the micro-organisms.

2. By preventing or delaying the action of micro-organisms.
3. By stopping the action of enzymes.

1. By killing the micro-organisms

You already know that boiling of milk kills micro-organisms. Sometimes, heat is applied for a shorter duration to kill only undesirable micro-organisms, that is those which can spoil the food stuff. It is done while pasteurizing milk. The cooking that you do at home also keeps food free from micro-organisms. In canning, (sealing in tins) food is heated to high temperature to prevent growth of micro-organisms in food.

2. Preventing or delaying the action of micro-organisms

You all know that a peeled apple spoils faster than one with intact skin. Do you know why? This is because the apple has its skin as a protective covering which prevents the entry of micro-organisms. Similarly, the shell of nuts and eggs, skin of fruits and vegetables serve as a protective coating and delays the action of micro-organisms.

Food packed in polythene bags and aluminium foils are also protected against micro-organisms. You have read earlier that micro-organisms need air and water to grow. But if these are removed, you can prevent the action of micro-organisms and ensure that food does not get spoilt.

Lowering temperature or freezing a food also helps in delaying the action of micro-organisms and thus in food preservation. You must have come across frozen foods. Frozen food can be kept for a longer time than fresh food. This is because micro-organisms cannot act at low temperatures. Thus, when you are putting food in the refrigerator or freezer, you are preventing the micro-organism from growing. Lastly, certain chemicals like sodium benzoate and potassium metabisulphite also help in preventing the growth of micro-organisms. These chemicals are called ‘preservatives’.

Thus you have learnt that the action of micro-organisms can be delayed or prevented in many ways:

- by providing a protective covering
- by raising the temperature
- by lowering the temperature
- by adding chemicals

3. By stopping the action of enzymes

Enzymes also cause food spoilage. They are naturally present in food. Take the example of fruits. Keep a raw banana for a few days and observe what

happens to it. Yes, the banana will turn ripe, become yellow and then start decaying and browning. All this happens due to presence of enzymes. What will happen if the action of enzymes is stopped? The foodstuff will be prevented from spoiling.

Enzyme action can be prevented by giving a mild heat treatment. Before canning or freezing, vegetables are dipped in hot water or exposed to steam for a few minutes. This is known as *blanching*. When you heat milk, you are not only killing micro-organisms present in it but also stopping the action of enzymes. This extends its shelf life.

INTEXT QUESTION 9.1

1. Which of the following will not help to arrest the action of micro-organisms on tomatoes :
   (a) put them is boiling water
   (b) put them in a freezer
   (c) leave them on the shelf.
2. List four ways of delaying action of micro-organisms on apples.

   .....

   .....

   .....

   .....
3. Define preservation and shelf life.

   .....

   .....

   .....

   .....

9.3 HOUSEHOLD METHODS OF FOOD PRESERVATION

Some of the practical methods which can be used for preserving food at home are:

(i) Dehydration (Drying)

(ii) Pickling with salt, spices and/or oil

(iii) Making jams, jellies, *murabbas*

(iv) Bottling of squashes and juices

(v) Freezing

i) Dehydration (Drying)

Preservation of foods by drying is an age old method. Drying is observed in cereal grains, legumes and nuts. All these dry on the plant itself.

Dehydration usually implies the use of controlled conditions of heating, with the forced circulation of air.

Dried foods are preserved because the available moisture level is so low that micro-organisms cannot grow and enzyme activity is controlled. Due to their reduction in weight, dried foods are more easily transported and stored.

You can make various types of *papads, amchur,* potato/banana and tapioca chips, *badis,* etc., by sun-drying at home. Vegetables can also be sundried by first blanching and then drying. You can sun-dry beans, peas, potatoes, cauliflower, ladies finger, garlic, onion and all leafy vegetables. Fruits like apricots, bananas, dates, grapes, peaches, pears, apples, etc. can also be sun-dried. The process is simple.

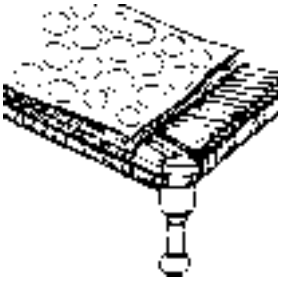


Fig. 9.1: Dehydration

Green leafy vegetables like *methi, pudina, palak* are washed thoroughly, plucked, spread on a clean cloth and sun dried. They are covered with a muslin cloth to prevent contamination by dust. After drying, they are stored in clean, dry, air-tight containers.

POTATO CHIPS

Ingredients

Potatoes
Salt
Polythene bags
Water
Potassium metabisulphite (KMS)
Trays or big plates or large polythene sheets
Muslin cloth

Method

Wash potatoes, peel and cut into circular pieces of 2-3 mm thickness. Dip the pieces in boiling water for 3-4 minutes. Take out and dip the potato chips in cold water containing little salt and potassium metabisulphite for 10 min-

utes. For 1 liter of water, add 20 grams of salt and 3 grains of potassium metabisulphite. This is done to prevent blackening of the vegetables.

Strain and arrange the potato slices on a tray or polythene sheet. Cover with muslin cloth and place in the sun for several days till completely dry. Store in air-tight containers or pack in poythene bags.

Note : Raw banana, tapioca can also be dehydreated similarly.

ii) Pickling with salts, spices and/or oil

There will rarely be any house in India where pickles are not eaten. Recall the pickles that you ate this season.

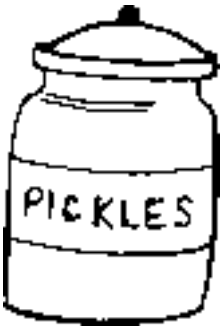


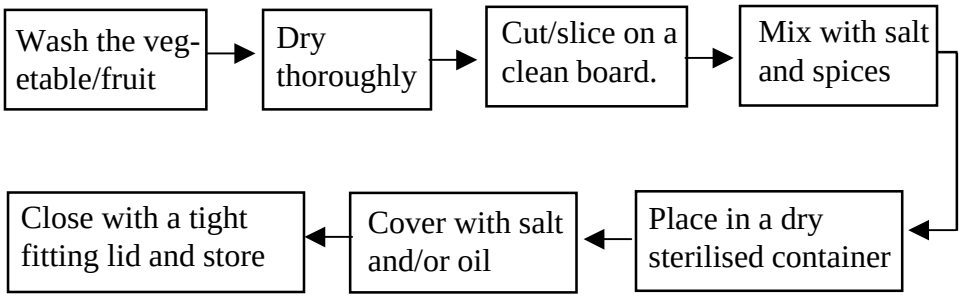
Fig. 9.2: Pickling

Do you know how salt, spices and oil help in preserving the pickles? We know that every foodstuff has some amount of water in it, which helps micro-organisms to grow. When salt and spices are added, they draw out the water from the foodstuff, thus micro-organisms cannot grow. Moreover, they improve the flavour of the food being preserved. Spices such as mustard, pepper and *hing* (asafoetida) are used in pickling.

You must have observed that the pickle is usually covered with a layer of oil. Why? This is because, the layer of oil prevents the foodstuff from coming in contact with the air, thus preventing the entry of micro-organisms, which can spoil the pickle.

Foodstuffs that can be pickled are lemon, mango, amla, carrot, ginger, cauliflower red/green chilli, etc. You can surely add many more to this list.

The process of preparing a pickle is simple.


Wash the vegetable/fruit
Dry thoroughly
Cut/slice on a clean board.
Mix with salt and spices
Place in a dry sterilised container
Cover with salt and/or oil
Close with a tight fitting lid and store

Here is a receipe for sweet lemon pickle. You can prepare other pickles in the same way as explained above.

SWEET LEMON PICKLE

Ingredients	Quantity
Lemon	1 kg
Salt	150 g
Black salt	100 g
Cloves (powdered)	2 No.
Ajwain	40 g
Hing	1 g
Black pepper powder	40 g
Sugar	200 g

Method

Select round, fully mature and juicy lemons. Wash well and dry. Cut each lemon into 8 pieces. Put in a clean jar. Add all the spices and sugar. Shake well. Keep the pickle in sun for 10-12 days, shaking it occasionally.

(iii) Making jam, jellies and murabbas

You can make jam by boiling the fleshy part (pulp) of the fruit with sufficient quantity of sugar to a thick mixture. You can make jams with apple, mango, papaya, pineapple, raw mango, etc.

Jellies are prepared by boiling the fruit with or without water and straining it. Then the strained and clear juice extract containing pectin (helps to set the jelly) and acid is mixed with sugar and the mixture is boiled. It is boiled to a stage at which it will set to a clear jelly-like substance. A well made jelly is transparent, well set and has the original flavour of the fruit. Guava, pineapple and orange can be easily converted into jelly.

Fig. 9.3

Murabbas are made by boiling the fruit in sugar solution, till they become soft. Murabbas are popular for eating with chapatis, puris, etc.

Let us now learn how to make a mixed fruit jam and amla murabba.

MIXED FRUIT JAM

Ingredients	Quantity
Mixed fruit pulp	500 g
Sugar	500 g
Citric acid	4 g (1 teaspoon)
Water	100 ml
Fruit essence	few flrops
Red colour	1/2 teaspoon.

AMLA MURABBA

Ingredients	Quantity
Ingredients	
Amla	1 kg
Sugar	1.5 kg

Procedure	Procedure
1. Wash the fruits, peel them and cut them into small pieces. You can use banana, apple, sapota (cheeku), mango, etc. 2. Convert fruit pieces into pulp by mashing them manually or in a mixer. Boil 3. the apple peels and seeds in 100 ml of water. Strain it and add the water to fruit pulp (This will extract pectin from peel. Pectin is a substance which helps in setting the jam). 4. Boil fruit pulp for about 15 minutes. Add sugar. Continue boiling with constant stirring. 5. After about 30 minutes, when the mass starts thickening, add citric acid dissolved in small amount of water. 6. Continue boiling till the pulp falls from the spoon in the form of a flake or sheet. When you put a small amount of this into a plate of cold water, it will settle in one place. This shows the end point or the point at which the jam is ready. 7. Remove the jam from fire and add essence and colour. 8. Fill hot jam into clean, sterilized bottles and cool the bottles. While filling hot jam, place the bottles over a wooden board. 9. If you want to keep the jam for a long time, pour a layer of melted paraffin wax over it and cover the bottles tightly. This wax can be removed at the time of use.	1. Prick amla with fork and steam cook for 5 minutes 2. Add 50% of sugar (750 gm) to amla and mix well on the first day. 3. On the second day see that the sugar dissolves, if not remove amla from the syrup and heat till the sugar dissolves. Cool the syrup and add amla and left over sugar (750 gm). 4. Repeat on the third day. Add all the left over sugar. 5. Amla murraba is ready for use after 15 days.

(iv) Bottling of squashes

A glass of cold lemon squash is always welcome in summers. Lemon squash or any other squash can be easily prepared at home. For preparing squash, fruit juice is mixed with sugar syrup. The quantity of sugar depends on the quantity of fruit juice. Squashes should be stored in bottles with a narrow mouth and tight fitting lid. You can prepare squashes with lemon, orange, mango, grapes, pineapple, etc. .

Let us now learn how squashes are made.

General procedure for making squash

1. Extract the fruit juice and filter it through a sieve.
2. Make a syrup with sugar and water.
3. Add citric acid to the syrup and remove from flame when a white layer forms at the top.

4. Cool the syrup and filter it.
5. Mix with the juice extracted, add colour and essence.
6. Add potassium metabisulphite (KMS) or sodium benzoate. Mix and put in sterilized bottles immediately leaving some head space. (space between top of the liquid and the bottle cap).

Note :

(1) To extract juice from grapes cook for 5-10 min and pass through the strainer.

(2) To extract juice from pineapple, cut into pieces (without removing the skin) grate and squeeze with muslin cloth.

Ingredients	**Fruit Juice**				
	Lemon	**Orange**	**Lichi**	**Mango**	**Pineapple**
Fruit juice (kg)	1	1	1	1	1
Sugar (kg)	1½	1½	1½	1	1½
Water (kg)	¾	¾	¾	1	¾
Citric acid (gm)	—	25	25	30	25
Colour	—	1 tsp	—	—	1 tsp
Essence	—	1 tsp	—	—	1 tsp
KMS (tsp - tea spoon)	½ tsp	½ tsp	½ tsp	½ tsp	½ tsp

(KMS - Potassium metabisulphite.)

Sterilization of bottles: For preserving any product, it is essential that bottles should be properly sterilized. For this, fill a big vessel with water in which bottles can be dipped. Bottles should be left in boiling water for 20 minutes. Put a layer of cloth at the bottom. Place bottles over it. After sterilization, keep the bottles well covered so that they do not get contaminated again.

(v) Freezing

Freezing fruits and vegetables in season can be of great benefit as they can be available when they are not in season. For example, freezing of peas in winter when they are cheap and of good quality, can be of great use in summer when they are very expensive. Let us learn how freezing of peas is done.

FREEZING OF PEAS

Select fresh, tender peas and shell them. Take sufficient water to completely immerse the peas. Add 10 gms of salt for every 1 litre of water and boil. Add peas to the boiling water and leave for 2 minutes. Drain and cool immediately. Pack in small polythene bags, remove air by pressing and seal the bags. This is done so that no micro-organisms remain in the packet. Place the packets in the freezer.

You can also freeze cauliflower, beans, carrots, capsicum, ladies finger, green chana, corn, spinach, methi, etc. in the same way. A temperature of 18^0C is recommended for storage of frozen foods. The period during which the food can be stored successfully varies with food and storage temperature.

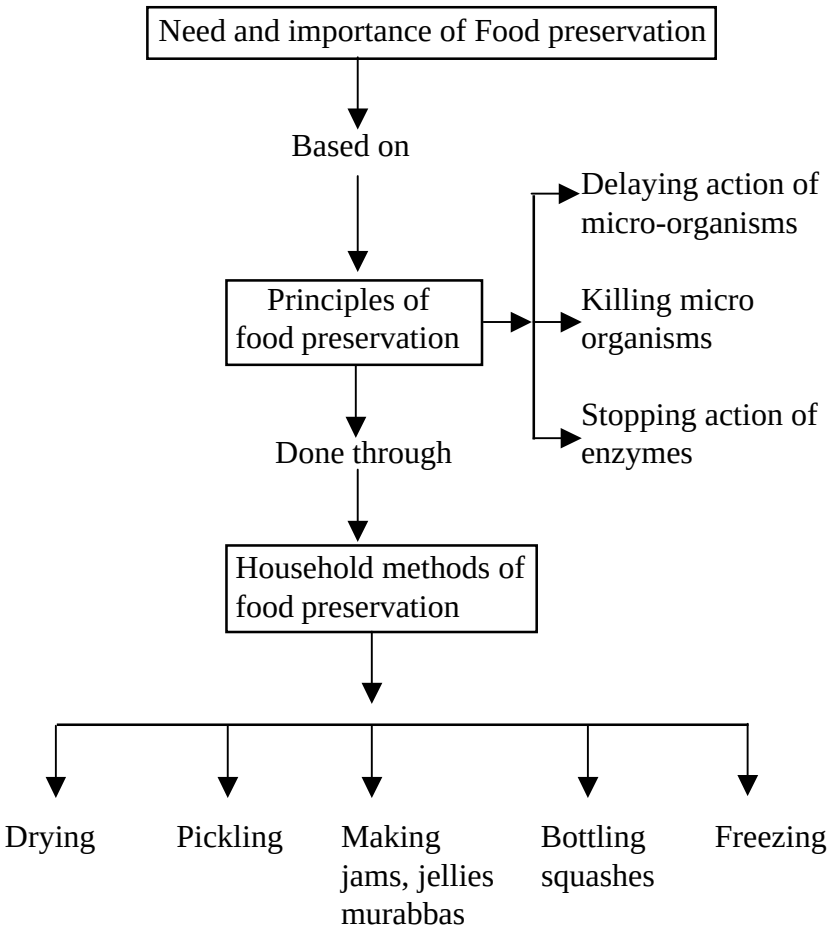
Activity 9.2 : Visit a market, find out the preservatives used in the following products:

S.No	Product	Preservative used
1.	Orange squash	
2.	Mango pickle	
3.	Guava jelly	
4.	Tomato sauce	
5.	Apple Jam	

INTEXT QUESTIONS 9.2

1. The common preservative used in making squashes is:
   (a) KS
   (b) KSM
   (c) KMS
2. Oil in pickles
   (a) delays the action of micro-organisms.
   (b) kills the micro-organisms.
   (c) stops the action of micro-organisms.
   (d) stops the action of enzymes.
3. Freezing preserves food because it
   (a) delays the action of micro-organisms.
   (b) kills the micro-organisms.
   (c) stops the action of micro-organisms.
   (d) stops the action of enzymes.
4. Write the steps for preparation of mango pickle.
5. Write the steps of freezing *methi* leaves.

WHAT HAVE YOU LEARNT



TERMINAL EXERCI1SE

l. What is food preservation?

2. Give four reasons why we should preserve food.

3. Suggest the best method to preserve the following foods and give one reason for each selection:

   (a) Orange juice

   (b) Raw mango

   (c) Apple

   (d) Potato

   (e) Carrots

ANSWERS TO INTEXT QUESTION

9.1 1. (c)

2. (a) Do not remove the peel
   (b) Pack apples in polythene/aluminium foil.
   (c) Keep in the refrigerator
   (d) Make jam

3. Refer to text

9.2 1. (c) 2.(c) 3. (c)

4. Wash mangoes; wipe with clean cloth; cut into pieces; mix in salt and spices; place in clean bottles; cover with oil; close with tight fitting lid.

5. Wash methi well; pluck the leaves and tender stems; pack in small polythene packets and seal; place in the freezer.

ANSWERS TO TERMINAL EXERCISE

1. Refer text

2. (a) To increase their shelf life
   (b) To prepare new products
   (c) To reduce the bulk of fruits and vegetables
   (d) To prevent spoilage and wastage of food

3. (a) as squash
   (b) as pickle
   (c) as jam or jelly
   (d) as wafers
   (e) as pickle

For more information log on to

http://www.recipedelight.com/indianchutneypickles.htm
http://www.bawarchi.com/hom.html

10

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FAMILY RESOURCE MANAGEMENT

All of us want to lead a peaceful and fulfilling life. We want to get good food, clothing, education and a house for comfortable living. Do you think that all families get all these things? How will you know that all families enjoy a comfortable and happy life? Observe the families living around you. Despite living in the same locality, same kind of house with almost the same amount of income and family size, you will find that some of them are happy and well settled, while some others are dissatisfied.

Do you know the reason for this difference? What can be done to ensure that all families are happy and satisfied? Let us find out how we can help the families to achieve this.

OBJECTIVES

After reading this lesson, you will be able to do the following:

- explain the terms 'resources' and 'management';
- identify and classify resources;
- describe the characteristics of resources;
- describe ways of maximizing satisfaction from the use of resources;
- explain the significance of management in day-to-day life;
- enumerate the steps involved in the management process;
- identify the motivating factors in management;
- discuss the role of decision - making in the management process.

10.1 RESOURCES

When you want to buy a dress, you need money. Similarly, when you want to go to your friend's house, you will walk or use a vehicle. You will need land and money when your family wants to build a house. In the same way, we need other resources like knowledge, material things, skills etc. to perform all our activities. Thus, we find that we need a lot of things to do our day-to-day chores. These can be called our resources. Therefore, we can say that the means used to meet our needs are called resources.

> Resources are the means for satisfying our needs and reaching our goals.

10.1.1 Types of Resources

You have earlier seen that we have many resources like money, time, land, knowledge etc. Take a sheet of paper and note some more of them. Did your list include the following?

– Money, salary, rent, interests from savings bank account etc.

– Your house for living and working.

– Time, like an hour a day, month etc.

– Energy to do work.

– Knowledge, skills and abilities for doing our work, like sewing, driving, swimming, etc.

– Material goods like household equipments, car etc.

– Community facilities like park, hospitals, roads, bus etc.

When you look at this list carefully, you will realize that there is a difference between resources like money, house, equipments, etc., and resources like knowledge, time, skills and abilities. A house or an equipment would have a fixed cost for everyone, i.e., anyone can buy these things at the same price. However, your knowledge or skill can be very valuable for you and your family while it may not be of the same utility to others.

Your energy is a resource for you and can be used to do any work that you want to do. But your energy can not be used by others to perform what they want to do.

Similarly, if your mother has the skill of being a good doctor, it is something which belongs to her and only she can use it.

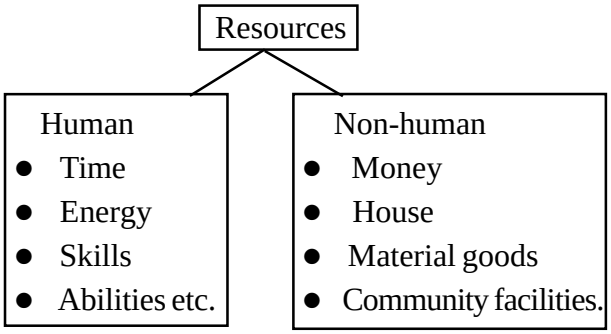
Thus, some resources become a part of an individual and can be used only by that person. Such resources are called 'human resources'. Examples of human resources are time, energy, knowledge, skills and abilities.

> The resources possessed and utilized by persons are called human resources.

The amount of human resources available will vary from one person to another. Therefore, they can be acquired and cultivated.

At the same time, there are some other resources which are available for everyone to use. They are more easily recognized than human resources. Some of these resources like park, and community facilities are available to all of us. However, it is for us to make use of them properly and take advantage of their uses. Such resources are known as 'non-human resources'. Some examples of non-human resources are money, house, land, material goods and community facilities.

> Non-human resources are external to individuals, but they can be possessed and utilized by them.



Activity 10.1: List all your own and your family member's human resources. Also suggest two possible goals each that you and your family can achieve using these resources.

INTEXT QUESTIONS 10.1

1. Your friend wants to become a doctor. She is living with her parents and a brother, who wants to become an engineer. Both of them, your friend and her brother, are studying in classes VIII and XII respectively ? Now state:

   a) resources they will need to reach their goals.

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   .....

b) Categories to which these resources belong.

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2. Separate and prepare a list of the following resources as individual and family resources:

a. House. .....

b. Baking skill of your mother. .....

c. Your ability to ride a bicycle. .....

d. Your father's capability of driving a car. .....

e. Car. .....

f. Inherited land in your village. .....

g. Equipments in your house. .....

h. Monthly salary of your father. .....

3. List the kind of resources you will need for the following:

a. Reaching your office on time everyday

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.....

b. Giving a party to your friends after passing your NIOS examination.

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10.1.2 Characteristics of Resources

Both human and non-human resources have some common characteristics. These are listed below.

- **Resources are useful:** Resources can be used to fulfill our needs and wants. That is why they are called resources!

  For example:

  - A house provides shelter.
  - A bus helps to reach our office and school.
  - Your mother's ability to sew clothes helps the family to get clothes stitched on time and to save money.

- **Resources are limited in supply:** Every resource is limited in supply. You have only 24 hours in a day. Similarly, the salary obtained in cash is also fixed. You have only limited supply of energy. In the same manner, resources like water, electricity, fuel, etc, are all limited in supply. To get maximum benefit, we must make efforts to conserve them.

- **Resources are inter-related:** When you work, you need resources like time, energy, skill, equipments etc. Without adequate supply of time and skill, you will not be able to use your energy to operate the equipment. Thus you will realize that all these resources are used at the same time, because their uses are inter-related.

- **Resources have alternate uses:** Most resources have alternate uses. For example you can use the same time for a number of activities like cooking, studying or watching television. Similarly, you can use your family savings for the purchase of a house, equipment or for higher studies. Thus resources have alternate uses.

- **Resources can be substituted:** To achieve the same goal, we can use one resource or the other. To reach your school or office, you may use your energy and time resource by walking or use money resource by traveling in a bus. Other examples are the use of ready-made or convenience foods instead of preparing them at home. Therefore, one resource can be substituted for of the use of another resource.

Thus we can see that all resources have similar characteristics. Therefore we should

- Create and cultivate them to enhance their availability.
- Conserve them as they are limited in supply.

For example, to obtain the above two things, try to improve your knowledge and skill in sewing to stitch your clothes; earn money and satisfy your creative urge.

10.1.3 Ways of Maximizing Satisfaction

While using resources, we have to ensure that we utilize them in such a way that we get maximum benefit from their use. This way we will be able to get maximum satisfaction. The different ways by which we can achieve this are listed below.

- Identify all the available resources.
- Make use of only the right amount of resources.
- Substitute the less expensive resources for the more expensive ones.
- Develop the habits that can enhance the use of resources.
- Cultivate practices to increase the availability of resources.
- Learn to share resources so that you do not deprive others of their use.

- Do not waste resources.

Adopt the 3-R's - Reduce, Reuse, and Re-cycle the resources to maximize satisfaction from their use.

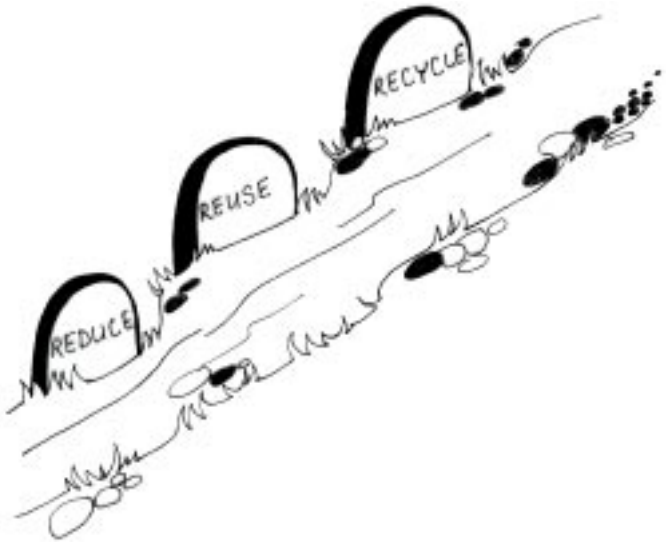

Fig. 10.1: Ways of maximizing satisfaction from resources

Activity 10.2: Identify at least five human and five non-human resources available to your family and compare this list with that of your friend's list. Suggest at least 2 ways by which you can enhance or maximize their utility.

INTEXT QUESTIONS 10.2

1. List any four ways of maximizing satisfaction from resources.

   (i) _____

   (ii) _____

   (iii) _____

   (iv) _____

2. Give an example of a resource that you can create or cultivate in yourself.

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   .....

   .....

3. What are the three 'Rs' that you should adopt to get maximum satisfaction from the use of resources?

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10.2 MANAGEMENT PROCESS

Let us take the following example:

You want to visit your grandparents living in a different place. What all will you do to arrange your visit?

In this context, you need to do the following:

- list the things to be done for the journey;
- buy the ticket for the date as planned earlier.
- collect all things for making the trip comfortable.
- buy the things that are not available with you
- check whether you have everything you planned and pack your baggage like clothes, food, shoes, water bottle, towel, soap, etc.
- inform your grandparents
- take the train and leave for your grandparents house.

Now, can you say how you have planned this trip successfully and how you collected all the things you wanted for a comfortable journey? Yes, the process you have used in this case is called management, and the things you have used are your resources. Yes, you have managed a number of things to see that you are able to visit your grandparents as planned by you.

Therefore, we can say that

> Management is a process of using what you have to achieve what you want.

10.2.1 Significance of Management

Let us now imagine what could have happened if you had not done or managed what you had planned to do, as listed earlier? Yes, you could have faced some of the following problems–

- You could have reached the station late.
- Without a proper ticket, you may have had to cancel your journey.

- You could have missed packing your food or drinking water.
- You may have found your grandparent's house locked when you reached there.

You will now agree that management is an important tool even to make a simple job like making your trip a success. Similarly, many other situations in our life also need management. We can therefore say that management plays a significant role in our day-to-day life. Management helps you to:

- reach your goals,
- achieve what you want,
- utilize your resources properly,
- make your life more systematic,
- avoid wastage of resources,
- increase efficiency in work situations,
- achieve a better standard of life.

10.2.2 Steps in the Management Process

You have now learnt that management is an important aspect of our lives. We have to achieve a large number of goals and satisfy our wants. Whether your goal is more important or less important, you need resources to achieve it. You are also aware that resources are limited. To achieve our goals with limited resources, we have to follow a systematic method. Management involves the following steps:

- Planning
- Organising
- Controlling
- Evaluating

You will see that everyone follows a particular procedure when they work towards their goal.

First you have to think about what to do and how it is to be done, that is, you do the **planning.**

Then you assemble the resources and assign the responsibilities. In other words, you are **organizing.**

After that you perform the actual task, i.e., you put your plans to action or you are **controlling** your activities so that it is according to your plans.

Once the task is over, you check to see whether everything went according to your plan or not. In other words, you are **evaluating.**

Following is a detailed description of each step of management. These are called the steps in Management.

Thus, there are four steps of management.

Step 1: Planning

The first step in management consists of thinking in advance of what needs to be done i.e., planning. A simple way to plan is to make a list of all the things that need to be done. Since certain things have to be done first and others later, arrange them in a proper order or in a sequence. If you take the example of your trip to your grandparent's house, you planned all the things that needed to be done. After that, you collected the things and shopped for the others. For example, you first took money from the bank and then went to the station to buy tickets for the journey. You collected your ticket and the other things like bedding, soap, clothes, towels etc; you packed them in a suit case.

While doing this you had arranged each activity in sequence in which it was to be done.

Besides following a sequence, you also need to make the plan flexible so that you can make changes at the last minute, if needed. For example, suppose you find that tickets are not available for the 15th of July, you then get tickets for another train on the same day or in the same train for the next day. Thus, planning involves-

- Listing activities
- Sequencing activities, and
- Providing flexibility for any adjustments.

Now, can you say, why is planning important? Yes, it is important so that you do not forget any important aspect once you start carrying out the task. You also have something in your hand so that you can start organizing your work.

In short, during planning think about the following:

- What is to be done?
- Who will do the work?
- How will it be done?
- When will it be done?
- What resources will be used?

Step 2: Organising

After planning, you have to organize your resources and your work so that the plan is carried out properly. Organizing involves assembling resources and fixing responsibilities.

Organizing means assembling
resources and fixing responsibilities to carry out a plan.

Let us now go back and once again examine the example given earlier.

When your were planning for your trip to your grandparent's house, you decided to go to the station to purchase tickets, that is, you fixed the responsibility on yourself. But a plan may not always involve you only. For example, if you decide to buy the ticket for your trip, you may decide to do it yourself, or you may take the help of your brother or your mother.

Thus, after deciding who does what, you set about collecting or assembling everything that you needed to prepare for the trip. All these activities of fixing responsibilities and collecting resources make up the second step of management, that is, organizing. While assigning tasks to other people, we must make sure that -

They have the time and ability to do that work and are willing to do the same.

For example, if you could not go and get the ticket yourself, you could have asked your brother to buy the ticket, because his office is close to the railway station. Thus he will be in a position to buy the ticket.

Can you say what would happen if you did not organize your work? Can you think of what would happen if you assigned tasks to people who were not willing or able to do them? What would happen if you asked a very busy person to do something for you?

Yes, you are right, the work would either not be done properly, or not done at all. Therefore, your plan would not be successful.

Can you now say why organizing your activities is important?

Organizing ensures that:

- all the planned work gets done,
- there is proper distribution of work,
- work gets finished on time,
- time, energy, and other important resources are saved, and
- your planning is successful.

This means that since the work gets distributed among two or more persons, it saves time and energy. Since more than one person is doing the work, all the work gets done and no one is overburdened, that is, there is a fair distribution of work. By doing so, there is no wastage of the resources and they are also conserved.

Activity 10.3 : Prepare a plan of a picnic for your family and list the activities to be performed. Distribute work among family members according to their ability and time available to them.

Step 3 : Controlling

Once the plan is ready and the resources are organized, actual work starts. Controlling is necessary at this stage, because activities must move according to the plan. Can you look at the earlier example? We have discussed there that if you cannot get tickets, you have to think of an alternative arrangement. So, if you really have to do what you have planned, you need controlling your activities to see that the original plan is implemented.

Controlling is also known as putting a plan into action. As the plan is being carried out, you also have to check the progress of your plan. When you do this, you may sometimes find a changed situation which calls for a fresh decision. For example, suppose you had planned to go on 15th, but find that no ticket is available, what will you do? You may have to decide on one of the following:

- Change the train; or
- Change the date of departure; or
- Cancel the trip.

Since you may not like to cancel the trip, you decide either to take a different train or decide on a different date for the same train. This arrangement is called controlling.

You make adjustments as the plan is being carried out or implemented. You change or control your activities so that your plan is not a failure. This is also called **flexibility.**

Controlling means carrying out the activities as planned and organized earlier.

Step 4: Evaluating

Evaluating, means checking the progress of your plan and taking corrective measures if needed.

For example when you cook a meal for your family, you want to taste whether it is done properly or not. You also see whether everything is made in adequate amounts. Evaluation helps you to check your mistakes and improve your work and product.

Thus evaluation helps you to understand your weaknesses and mistakes so that it is checked and will not be repeated in future. This is also called looking back or "feedback".

Though you may find that evaluation is listed as the last step, it is done at each stage of management i.e. planning, organizing, and controlling. You have to evaluate at every stage so that you do not regret in the end. Since you are constantly evaluating your work, you come to know the defects of your planning, organizing and controlling. Sometimes, you are in a position to bring a change in your planning and/or organizing and controlling. If you can, you tend to improve end results and complete the process smoothly and successfully. If not, you learn to do a better job in future.

Activity 10.4: Observe your father's management of repair and maintenance activity at home. Suggest some management tips to help him with this activity.

INTEXT QUESTIONS 10.3

1. Define management.

   .....

   .....

2. List two advantages of management. Explain with an example each.

   .....

   .....

3. List three important things involved in planning.

   .....

   .....

4. Re-arrange the following stages of the management process in the correct order.

   (i) Organising .....

   (ii) Evaluating .....

   (iii) Planning .....

   (iv) Controlling .....

5. State whether the following statements are true (T) or false (F). Justify your answer.

   (i) Planning does not need controlling.

   .....

   .....

   (ii) Evaluation is often not required while controlling.

   .....

.....

(iii) Plans are fixed in nature.

.....

.....

(iv) Everyone in the family should consult others while preparing their own plans.

.....

.....

(v) While organizing, you need to fix responsibilities to carry out the plan.

.....

.....

(vi) Anyone can do any activity to accomplish a plan.

.....

.....

6. List with an example the activities involved in :

(i) Organising

.....

.....

(ii) Controlling

.....

.....

10.3 MOTIVATING FACTORS IN MANAGEMENT

Fig. 10.2: Motivating factors

There are three motivating factors. These are:

- **Values**
- **Standards**
- **Goals**

- **Value**

A value is a moral principle and/or belief that a person holds about some aspect of life. You value honesty, punctuality, kindness, sincerity, health, good habits, happiness, etc. It motivates you to behave in a particular way. For example, you value good health that is why you tend to eat right food and also do regular exercise. You join yoga classes or aerobics or go for a morning walk. You value time that is why you try to be punctual for your appointments.

Different people may give importance to different values. You may not necessarily have the same values as your friend.

Your values may remain same or change in life. For example, you value honesty and hence do not tell a lie ever. But you may fall in bad company and then start telling lies. Your value for honesty thus disappears.

You may also aquire new values from time to time eg., you may start valuing food and do things to save it from wasting. You may start valuing independence and therefore get encouraged to do things yourself. This may help you not only in independence but also in developing your skills and raising your self esteem. So do you see how the values you hold help you to go into action? Can you list some more values and the related actions?

- **Standards**

Standard is an accepted level of quality. Hence it is a measure of values that compel individuals to perform actions that will give the desired satisfaction.

Whenever we do any work, we measure our performance against a standard. When we clean a room we see that everything is back in its place, it is dusted and polished, floor is swept and mopped and so on. The room is not clean till any of the jobs remains undone.

Some standards are self dictated, others are demanded or dictated to us by our family and community. Therefore, some standards are flexible and some are rigid. You may have also observed that for the same task, you have a particular standard at a given point of time under certain conditions and another standard at a different time under different conditions. Let us take an example. Your mother may prefer to go to the market to select and buy fresh vegetables herself everyday. However, if she is unable to go to the market on a particular day, she may instead ask your father or you to go and buy the vegetables. Here, she is prepared

to accept the type and quality of vegetables that your father buys. The selection may not be as per her standard of quality, size and freshness of the vegetables, but still she is prepared to accept them.

The standards you hold are a reflection of the values you have and the aim you have for the future.

Some standards affect you alone, others may affect your family and your community. Hence, we should be very careful in selecting our standards. For example, when we hold "cleanliness" as our standard, we should not only keep our house clean, but also the places around our house. We should apply the same standard of cleanliness for our house as well as for our community. Throwing garbage from the house on to the street is not your standard of cleanliness.

- **Goals**

A goal is your aim or objective in life. You have joined this course at NIOS because your aim is to get a class XII certificate, is not it? You achieve them within the limits set by your values, standards, and the resources available. To define the term goals we can state that:

> Goals are the aims or objectives that we want to achieve and work for. Thus goals grow out of our values, needs and desires.

We expect that by accomplishing these goals, we get a sense of achievement, happiness and satisfaction.

Just as our values and standards change with time, our goals also keep changing. Some goals are achieved sooner than the others. Some goals are achieved more easily than the others. Some goals are reached within the span of a few minutes (eg cooking food), few hours (eg sewing a shirt) or few years (eg completing a degree course, owning a house, building a bank balance, etc). Sometimes, certain goals are dropped because they have already been achieved. For example, if you have finished your schooling your goal of schooling is dropped, instead a new goal of joining a college for a degree course is added to take its place. Can you think of some goals of this type?

To understand goals better, let us consider the example of Reema, Mahesh and Sanya who value health, hence, work for it by joining a class for jogging, aerobics and yoga respectively. The main goal that all of them are trying to reach is good health. However, Reema is jogging for half an hour everyday as her goal may be to lose a particular amount of weight by a certain time. Mahesh may be doing yoga exercises to improve his chronic back pain and asthma. Sanya may be doing aerobic exercises to increase her stamina, keep trim and maintain her body weight. Besides exercising, these three friends may also be aiming at taking a balanced diet, nutritional supplements, vitamins and tonics, etc. to improve their health. Thus, they may have a number of smaller goals to reach the larger goal of health.

Thus, you have learnt that your values and goals along with the stipulated standards are the main reasons for you to learn and use management process in day-to-day life.

INTEXT EXERCISE 10.4

1. List four values considered important by

   (a) you

   .....

   .....

   .....

   .....

   .....

   (b) your family

   .....

   .....

   .....

   .....

   .....

   (c) your friend

   .....

   .....

   .....

   .....

   .....

Q. Would you change your values and standards because your friend wishes you to do so? What factors should you consider while fixing your values, standards and goals?

2. Define values, standards and goals.

   .....

   .....

   .....

3. Categorize the following in the categories of

a)	a few hours	b)	a few days
c)	a few months	d)	a few years

1. Cooking food.....
2. Cleaning cupboard
3. Finishing an assignment for NIOS. .....
4. Receiving a certificate from NIOS.....
5. Knitting a pullover for yourself.....
6. Higher education for children.....
7. Marriage of a daughter.....

10.4 DECISION - MAKING

If you are to use the process of management as a tool to help you lead a harmonious, successful and satisfying life then you have to make correct decisions about the goals you wish to achieve, the standards that you want to maintain and the lifestyle you desire. You will observe that decision making is a continuous process. While making decisions, you have to make a choice among many alternatives. Considering different alternatives is important because then you are sure that you are following the right course of action and have not left out an option which could save you money, time, energy, or social/emotional problems. Hence, it is vital to learn how to make correct decisions while solving a problem or reaching a target or tackling a situation. What is the meaning of decision making? You can define a decision as:

> A decision is selection of a course of action among alternative choices.

What does it mean? On a rainy day you want to reach your office on time but do not want to use your bicycle. What are your options? You can take a bus, go walking, take a taxi or ask your friend for a lift in her car. You have to decide which option to use so that you reach office on time.

Making a decision involves a number of steps. These are:

1. Identify the problem.
2. Find out all the information you need about the problem and formulate possible courses of action, ie., solutions, to overcome the problem.
3. Consider and evaluate the consequences of each alternative course of action.
4. Select the best possible course of action.

Let us understand how to apply these steps of decision making by taking an example.

Step 1: Identifying the problem.

Your friend, Rahul and his family are not happy with their present rented house. They try to find out the reasons for it. They find the house too small for their needs because they are seven members and there are only two rooms to live in. There is very little open space for drying clothes. The kitchen is also very small. Above all, the neighbourhood is not very clean. Hence, Rahul's family wishes to change their house and preferably buy a house of their own. The underlying problem is that of their present house and selection of a new one.

While identifying the problem, it is important to be clear and unemotional. Rahul's family should not overlook the benefits of the present house. Their present house is close to Rahul's father's office and Rahul and his sisters' school. The market place is nearby and frequent trips can be easily made to buy things of day-to-day use. Yet, they are not happy with their present house. In the light of the above situation, keeping in mind the needs, desires and values of Rahul's family, we should now help them to move to the next step of decision-making.

Step 2: Find out information and possible courses of action.

Rahul's family should try and find out everything about the alternate houses available to them. The different localities and types of house (ie., flat or bungalow), number of rooms, feasibility and affordability of rent for a larger house versus owning a house, etc. To find out all the information, the family can take the assistance of a property dealer and consult their friends and neighbours for advice and experience. Ideally, Rahul's family should explore all possible alternatives within the constraints of their resources, especially time, energy and money. This will also help them to set certain limits within which alternatives can be thought of.

Step 3: Evaluation of alternate courses of action.

To make it easy, Rahul's family should consider two to three alternatives at a time and as one is rejected a new one should be added for consideration and evaluation.

Each alternative should be clearly analyzed for its consequences and ability to meet family goals and values. The desirable and undesirable consequences of an alternative should be considered to select the best choice. At the end, Rahul's family may decide to defer the purchase of their own house for the moment, as they do not have enough savings. Rahul's father may already be paying the installments for their car. So, he cannot afford to buy the house on installments until the car payments are taken care of. Thus, the family may decide to continue to live in a new rented accommodation despite knowing that owning a house would be the best solution to frequent changing of houses and paying a monthly rent. They now have to consider all alternatives for rented accommodation, ie., their list of alternative course of action has narrowed down to selecting a house on rent.

Step 4: Selecting the best course of action.

After looking at a number of houses Rahul's family decides to select a three bed-room flat on the ground floor in a near by new locality which is very clean and well planned. It has big houses, broad roads, a good market and is not very far from Rahul's father's office and the children's school. This house has a lot of open space in front and back, so that their children can play freely, there is adequate space for drying clothes, and Rahul's mother can also have a small kitchen garden. The rent is affordable and Rahul's father hopes that after paying off the car loan he can soon plan to save enough for making a down payment for a new house and pay off the remaining amount in easy installments. Thus, Rahul's family is very happy in their new house.

INTEXT EXERCISE 10.5

1. Your father wants to take the family for a picnic. Present the steps he should consider to decide about a suitable place and time for it.

2. State whether the following statements are True (T) or False (F). Give reasons for you answer.

   a) A decision is the selection of a number of courses of action among alternate choices.

   .....

   .....

   b) The first step of decision-making is to identify the problem correctly.

   .....

   .....

   c) A family's resources and goals are the major factors to be kept in mind while choosing among various courses of action.

   .....

   .....

   d) The course of action selected after analyzing all the alternatives should ideally satisfy all family members.

   .....

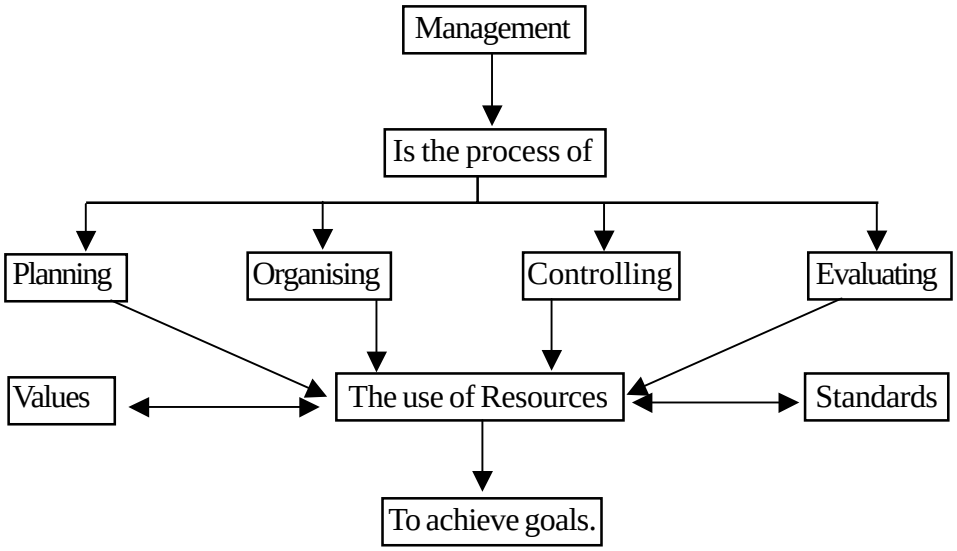
   .....

   e) Decision-making is a one time process to set up major family goals.

   .....

   .....

WHAT YOU HAVE LEARNT



TERMINAL EXERCISE

1. Define the term resources and classify them.
2. What is management? Describe the steps of management by using an example.
3. What are the three major motivations in the process of management?
4. Identify a major goal in your life. State the value (s) from which it originates and the standards (s) you have set to achieve it.
5. Write briefly the importance of decision making. List the steps of decision making.
6. Rearrange the jumbled letters to identify the correct term describing the statements written below:
   - (i) Means for reaching our needs and goals – CESURROSE
   - (ii) Using what you have to achieve what you want – MGEATMENNA
   - (iii) First step of management – INLAGPNN
   - (iv) Fixing responsibilities and assembling resources in management – NNSROGGEAII
   - (v) Carrying out the activities as planned and organized earlier – GIOONNTCRLL

(vi) Checking the progress of your plan and taking corrective measures – TVAALUENIO

(vii) Measures of worth that help you to make choices among alternate courses of action – SULEVA

(viii) Measures of values that compel individuals to perform actions that give the desired satisfaction – DTAASRNSD

(ix) Purpose that we want to achieve – OSALG

(x) Selection of a course of action among alternative choices – NECII DOS

ANSWERS TO INTEXT QUESTIONS

10.1 1. a) Resources needed to become doctor and engineer.

(i) Ability and skills

(ii) Secure good marks in class XII examinations.

(iii) Clear entrance examination.

(iv) Good health

(v) Reference books.

(vi) Furniture and place to sit and study

(vii) Money

b) Human resources : (i), (ii), (iii), (iv).

Non-Human resources : (v), (vi), (vii).

2. (a) Individual resources : b, c, d

(b) Family resources: a, f, g.

3. (a) Reaching office:

i) Time, money, energy, vehicle

ii) Money, ingredients needed for dishes, crockery, cutlery, furniture, space, table linen.

10.2 1. Refer Text.

2. Refer Text

3. Reduce, Re-use, Re-cycle.

10.3 1. Refer Text.

2. Refer Text.

3. Listing activities, sequencing activities and flexibility

4. Planning, organizing, controlling, evaluating

5. (i) F (ii) F (iii) F (iv) T (v) T (vi) F.

6. Refer Text.

10.4 1. Refer to text.

2. Refer to text.

3. 1. (a) 2. (a) 3. (b) 4. (d) 5. (c) 6. (d) 7. (d)

10.5 1. Refer to text.

2. (a) F, (b) T, (c) T (d) T (e) F

ANSWERS TO TERMINAL EXERCISE

1. Refer to text.
2. Refer to text.
3. (i) Values (ii) Standards (iii) Goals
4. Refer to text.
5. Refer to text.
6. (i) RESOURCES
   (ii) MANAGEMENT
   (i) PLANNING
   (ii) ORGANISING
   (iii) CONTROLLING
   (iv) EVALUATION
   (v) VALUES
   (vi) STANDARDS
   (vii) GOALS
   (viii) DECISION

11

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TIME & ENERGY MANAGEMENT

Radha and Sita are both friends. Sita stays at home the whole day and looks after the house. Whereas Radha, besides looking after the house has also taken up a job outside the house. Still, Radha seems to have time for every thing and all her activities get attended to. Sita on the other hand, always feels short of time and her various household activities keep pending. Also, there is more confusion in her house especially during morning when her children and husband have to leave for school and work respectively. By the time they leave she is totally exhausted. Have you come across women like Radha and Sita? What could be the reason for having more or less time to perform daily routines? You will study about this in the following lesson.

OBJECTIVES

After studying this lesson you will be able to:-

- define the term time plan and describe its significance;
- prepare a time plan;
- define the terms work and work organisation;
- classify work as heavy, moderate and light;
- state importance of energy management;
- define fatigue and list various types of fatigue;
- suggest ways to avoid and / or remove fatigue.
- enumerate various ways of work simplification.

11.1 MEANING OF TIME AND ENERGY MANAGEMENT

If you are able to complete every task you are supposed to do within the time limit, and also spend least amount of energy, you are in fact managing your time and energy well. In other words you can say that:.

Notes

> Making the best use of time and energy available to us to perform our tasks is known as **time and energy management.**

11.2 TIME PLAN

To manage time and energy efficiently, one needs to develop the habit of making a time plan. What is a time plan?

> A **time plan** is an advance plan of all the activities to be performed within the allotted time.

A time plan can be made for a part of the day, the full day, a week, a fortnight, a month or even a year. The plan for short periods of time may be just mental, not written. When a plan is made for a long period, it is usually in the written form.

11.2.1 Steps involved in making a time plan

How can you go about making a time plan? The various steps involved are:

1. List all the activities to be performed in the allotted time. For example, in the morning a working lady has to prepare breakfast, tiffin and lunch, get the children ready for school, get ready herself and go to work.
2. Underline all the activities which need to be done at a definite time, as in the above case, dropping a child at the bus stop or reaching office on time, etc.
3. Make an estimate of the time required for the activities listed, for example, cooking 45 minutes, getting ready 20 minutes, etc.
4. Arrange the activities in the sequence in which they are to be done. For instance, getting the children ready before the mother gets ready herself or cooking and packing of lunch/tiffin to be done before the children get ready.
5. Keep in mind the schedule of other family members and make necessary adjustments if required. For example, if the mother is preparing the breakfast, the father can get the children ready for school. But if the father also has to leave at the same time, then the mother will have to get the children ready and not wait for her husband's help. Similarly, if on some days the mother has to leave early then the other members will also have to adjust to her schedule.
6. While sequencing, the activities which require similar equipment or work area, should be listed together. For example, in the morning, cooking of breakfast and lunch can be performed together in the same time and place.

7. Once you have followed these steps, write down the final plan.

   – The plan thus written, should be practical, flexible and realistic

It is always better to be realistic. It is always better to alot 35 minutes for an activity which you think will get completed in 30 minutes. Keeping less time could leave you frustrated for not completing the activity on time.

These were the steps involved when you were making a time plan for a small unit of time i.e., morning or afternoon, or evening. When you make a plan for the whole day or a week you will follow the same steps of making a time plan for that period. However, for a plan involving longer periods of time, make provisions for rest and entertainment.

Similarly, if you thought that you would be able to tidy your house before leaving for work in the morning but realise that you do not have time left to do it, leave it for the afternoon. Do not feel guilty about it. When you come back from work you can do it then.

Period of Peak Load

There are certain times in each family when the members have to complete a number of activities in a small time. This is known as the *peak load time.* Let us consider the earlier example. A lady who has to go to office, has a very busy morning. She has to prepare breakfast, pack tiffins, make arrangements for lunch and get dressed and go to work. This becomes a period of peak load because all these activities are to be performed within a limited time. The same activities or even more when performed on a holiday do not cause much stress or tension because the time constraint is not there.

While making a time-plan peak loads must be given special attention. To reduce the demands of peak load periods the following steps can be adopted:

- All family members can assist in reducing the stress of peak load periods. Outside help can also be taken to meet the demands.
- Apply all the principles of work simplication. The details of work simplification are given in section 12.11 of this chapter.

Fig 12.1 MANAGING PEAK LOAD PERIODS

A Sample Time Plan

(A plan for morning activities for a working woman)

Time	Activity
5.30 – 5.45 a.m.	Wake up, go to toilet, brush teeth
5.45 – 6.00 a.m.	Have tea
6.00 – 7.00 a.m.	Prepare breakfast, tiffins and lunch.

7.00 - 7.30 a.m.	Get the children ready for school.
7.30 – 8.00 a.m,	Get ready to go to office
8.00 – 8.15 a.m.	Have breakfast
8.15 – 8.30 a.m.	Lock the house and leave for work

Notes

Be flexible and have breakfast first and then get the children and yourself ready later.

Now you can make a time. plan for yourself for the whole day.

INTEXT QUESTIONS 11.1

1. Indicate whether the following statements are true or false by writing 'T' or 'F' against each statement:

   (i) To finish all our work on time, it is necessary to keep working throughout the day.

   (ii) Knowledge about all the types of work helps in preparing a time-plan.

   (iii) A time-plan is made for the present.

   (iv) A time-plan has to be practical and not realistic.

   (v) A time plan is prepared to squeeze time for all work, rest and entertainment.

Activity 11.1 : Prepare a typical day's time plan for yourself. Assume you are gainfully employed at home.

11.3 WORK ORGANISATION

In the example stated in the begining of this lesson, Radha was able to complete all her work on time. Can you guess why she or women like her are able to do this? Yes, you are right. Such women create a system of working which is efficient. If you observe the system of working followed by such women you will realise that they plan and organise their work properly. They place things in their specific places and plan their activities beforehand in accordance with the time at their disposal.

On the other hand, women like Sita do not plan and organise their work. They spend much time searching for misplaced things which lead to wastage of time and fatigue. To complete morning activities more smoothly, if only Sita had packed her children's school bags and ironed their uniforms at night, she would have had more time in the morning to finish other activities.

In addition to this if she would have collected the uniform, shoes, socks, bag,

water bottle and placed them at one place at night, her children would not have had any problem in getting ready. Even if her husband had to get the children ready he would have found every thing at one place.

Can you now define **'Work Organisation'?**

Notes

> Work organisation is planning, arranging and performing one's activities in such a way that they are completed in the allotted time with minimum energy expenditure.

How do you do this? To understand this let us know more about work, its sequencing and simplification.

11.3.1 Types of Work

All activities require time and energy. Some activities require very little energy whereas others may require a lot of it. You get tired after performing the activities which require a lot of energy. Depending upon the amount of energy required to complete the activity, these have been classified into light, moderate and heavy activities or work. Light work requires minimum amount of energy and heavy work the maximum.

Type of Work

Light Work (uses minimum energy)	Moderate Work (uses medium energy)	Heavy Work (uses maximum Energy)
— cutting vegetables	— sweeping	— mopping the floor
— dusting	— cooking	— manually washing heavy clothes
— writing	— cleaning utensils	— running
— reading	— using a semi-automatic washing machine	— climbing stairs
— knitting		

Fig. 11.1 : Light work

Fig. 11.2 : Moderate work

Fig. 11.3 : Heavy work

You can enlarge this list by carefully examining each activity that you perform.

While planning your daily activities you must understand the nature of each activity and take care that you alternate heavy work with light or moderate work. This will help in preventing tiredness and improve your efficiency. Remember, efficiency means completing the work within the time limit and spending the least amount of energy.

Notes

INTEXT QUESTIONS 11.2

1. Fill in the blanks :

   (i) When you save time you can also save .....

   (ii) By work organisation you are not only able to save time and energy but also reduce .....

   (iii) Light work requires.....energy as compared to moderate work.

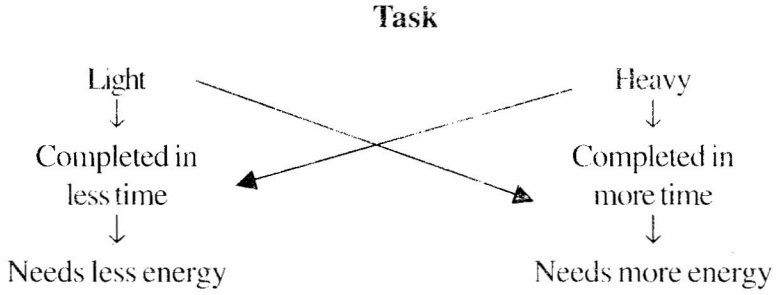
   (iv) ..... work requires the maximum amount of energy to be completed.

2. Classify the following into light, moderate and heavy work:

(i) Gardening	(v) Mopping the floor	(ix) Studying
(ii) Brisk walking	(vi) Making a rangoli	(x) Playing hockey
(iii) Playing chess	(vii) Painting a door	
(iv) Digging	(viii) Sewing a dress	

11.3.2 Work Simplification

You have learnt that doing work requires energy and different types of work require different amount of energy. You should also know that time spent in completing a job is also related to the amount of energy. For example, you spend more energy if time spent on the task is more. If time spent to complete the task is less, energy spent is also less. It is just like if the task is light you spend less energy and if the task is heavy, you spend more energy. Hence, if the task is heavy but you finish it fast then you spend less energy than when the same task is completed in a longer time. Fig. 12.2 shows this relationship between type of work, time and energy required to complete it.



Thus you can reduce the energy spent to complete a job by:

(i) reducing the time, spent or

(ii) making the task simpler.

In fact, if you make the task simpler, you will automatically be spending less time on it. For example, you can use a grater to grate vegetables or you can use a food processor to save your energy and the job is done faster. Similarly, if you collect everything you require for washing clothes before you actually sit down to wash them, you will definitely save both time and energy. Thus, in both these examples, you are simplifying your work to save energy and time. Can you now define work simplification in your own words?

Notes

> **Work simplification** is a method of saving time and energy by using a simple procedure and/or a labour saving device to complete a task.

Work organisation is a much wider concept than work simplification. Here, you plan your activities in advance. You know that if planning is done beforehand you will save time while actually performing those activities. While planning and organising you also think of tools and procedures which could simplify your work.

For example, if you decide to give a party on your birthday, you will first plan about all your requirements and how they are to be achieved. This is work organisation. While actually doing the work for the party you adopt ways which will save your time and energy. For example, you use a mixie to grind the masalas, you use paper plates and disposable glasses which do not require any cleaning and washing before and after the party. This is work simplification. Can you think of some more ways of simplifying your work while working for your party?

11.3.3 Methods of Work Simplification

Let us now study about the various ways or methods of work simplification.

(i) Keeping your work place organised : You are now aware that while working if all the required things are kept within reach and at an appropriate height you are able to finish your work by spending less of your time and energy. For example if you are cooking you would like that all the food stuffs, utensils and source of water are near the place where you are cooking. Also the height at which these things are kept or stored is appropriate. This means that while working you do not have to move often or stretch yourself every time you need a something. Besides this, the storage containers can also be transparent and labelled so that you do not have to hunt for the things you require.

(ii) Using labour saving devices - Using washing machines, mixie, or a food processor for doing your work saves a lot of time and energy. You know now that if you were not using a washing machine to wash clothes you would have to do it manually. This would definitely require more energy and time. Use of a pressure

cooker, peeler, chapati maker, spray gun, vaccum cleaner, etc., are some of the other examples of work simplification through use of labour having devices.

Notes

- If you have to carry many things from one place to another you can save your time and energy by using either a tray or a trolly. Compare the number of trips required to lay a table when using both your hands and when using a tray or a trolley. Decide for yourself which is better.

Fig. 11.4: Trolley for carrying things

(iii) Using appropriate work movements - While doing your work if you use rhythmic movement and cut down all extra movements, you feel less tired at the end and you also save time. Some of the ways by which you can do this are:

- While mopping the floor, use long continuous movements instead of short, jerky and zigzag movements.
- You can save time by doing all the things that can be done in the same room in one go. For example, if you are making your bed, tuck in the sheets in long strides, i.e., spread the bed sheet and bed cover and then tuck them in together instead of tucking them one after the other.
- Keep utensils directly for drying on the plate rack after cleaning.

(iv) Changing the work sequence - Work can be simplified if it is performed in a proper order.

For example, when you have to iron clothes it would be much quicker and easier if you sprinkled water on all the clothes before you start ironing. If you sprinkle water on one cloth and iron it, and then on the next and so on it takes much longer.

Similarly, while cooking vegetables it would be better if you put the masala on the stove and while the masala is being cooked you cut the vegetables instead of first cutting all the vegetables and then starting to cook.

(v) Using appropriate postures - When you use the correct posture to do a

work you save both on time and energy. For example if you stand and cook, you get less tired than when you sit and cook on the floor. Getting up from a sitting posture is much more tiresome than standing. Similarly pushing is always easier than pulling.

Notes

- If you can work with a straight back then why work with a bent back? Keeping your back straight while working saves your time and energy. For example, use a long handled broom instead of the regular broom to sweep the floor.

Fig. 11.5

While drying clothes, keep the bucket containing clothes on a stool. You will realise that you do not have to bend everytime to pick up the clothes. This will keep your back straight and relieve you of the stress of frequent bending.

(vii) Working at appropriate height - Have you noticed that you feel more tired if you have to work in a kitchen where the work surface and storage is not in accordance with your height? Why? This is because you have to bend or raise yourself while working. Which of the following methods of ironing clothes is the least tiresome for you? Sitting on the floor, bending to iron the garment placed on bed or using an ironing board? Naturally the third one, as it is the most appropriate height.

Fig. 11.6

Notes

(vi) Dovetailing - Dovetailing is the process of combining two or more activities at the same time. This, way you can save both time and energy, e.g. after putting water to boil for making tea, you can knead the dough, heat the milk or cut vegetables till the time the water boils.

Can you suggest some more activities which can be dovetailed?

(vii) Using ready - to - consume items - Have you used ginger and garlic paste or onion powder to prepare masala instead of using fresh garlic, ginger and onion each time you cook? What is the advantage? Yes, you save time and energy. You can buy those from market or prepare these and keep it in your refrigerator. Pre-preparations save your time and energy when actually performing the activity. You can save still more time and energy by consuming ready-to-eat foods! You would also realise that using paper plates instead of normal crockery saves time and energy. Can you say how?

(viii) Attractive working place - If the work area is attractive and well organised, you tend to finish your work fast and spend less energy. This is because you enjoy working in such an environment. This increase in efficiency is mainly because of the mental satisfaction. You can make your work place attractive by:

- keeping it clean and tidy
- using bright coloured containers and patterned crockery
- organising and storing things in their respective places
- providing ample light and ventilation.

Can you suggest some more?

(ix) Perfect your skills - If you practice and perfect a skill you will require less time and energy in doing that work. Besides this, you will also be able to get a better product. A tailor or anybody who has learned the skill of stitching can stitch clothes in a much better way and faster than an unskilled person.

Do you remember the popular saying "Practice makes perfect"?

INTEXT QUESTIONS 11.3

1. Tick mark the most appropriate answer out of the four options given:
   (i) Work simplification leads to
      (a) spending more money
      (b) reducing work heights
      (c) saving time and energy
      (d) use of gadgets.

(ii) Dovetailing is

(a) finishing a job before starting the next.

(b) doing two or more activities at the same time.

(c) working at correct height.

(d) using a labour saving device.

(iii) Correct posture helps us to

(a) do work on time

(b) get enough rest

(c) do two activities at the same time

(d) save energy while working.

Activity 11.2: Observe cooking and washing activities in your house. Suggest work simplification measures wherever necessary.

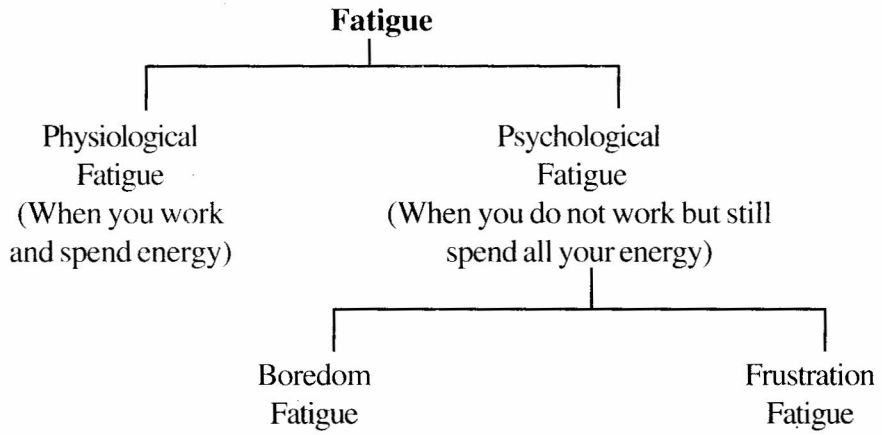
11.4 FATIGUE

What happens when you work for a length of time continuously? You feel like resting. This is because the capacity of your body to work has reduced and therefore, needs rest.

The feelings of tiredness causing desire to stop working is called fatigue.

This feeling may come not only because you have worked very hard but also because you have not worked at all or are unable to complete a task. Thus fatigue can be of various types.

11.4.1 Types of Fatigue


Fatigue
Physiological Fatigue (When you work and spend energy)
Psychological Fatigue (When you do not work but still spend all your energy)
Boredom Fatigue
Frustration Fatigue

Notes

(i) Physiological Fatigue - It occurs after you perform any physical activity, such as, sweeping, mopping, running or walking. After pefroming these activities you feel pysically tired because you have consumed all the available energy and some waste products have accumulated in the muscles. When you rest for some time, these waste products are removed from the muscles.

> Physiological fatigue occurs when a lot of energy is utilized for physical activities and you feel exhausted.

(ii) Psychological Fatigue - You must have noticed that sometimes fatigue may occur even when you have not worked at all or after doing a little bit of work. This type of fatigue may be the result of the feeling of boredom or frustration. You feel dissatisfied and restless, experience bodily discomfort and have a desire to stop work. This type of fatigue is called psychological fatigue because you feel fired psychologically although there is no physical reason to feel tired.

> Psychological fatigue occurs due the unsatisfactory work and work conditions and not due to physical exertion.

In *boredom fatigue,* there is dicontentment, yawning, restlessness and a desire to stop working. This happens because the work is monotonous and uninteresting. The working conditions are unsatisfactory or dull and the tools used are troublesome.

In *frustration fatigue* there is bodily discomfort, general feeling of tension, unsatisfactory results and a desire to escape from the situation.

This happens because the worker is inexperienced, disturbed too often, worried, overworked and not appreciated.

11.4.2 Ways to Remove Fatigue

It is very easy to remove physiological fatigue. All you need to do is :

- take rest briefly
- alternate light and heavy task
- use labour saving devices
- delegate some work to others
- make the work more interesting
- work in groups instead of alone
- have a proper work place
- have proper equipment
- develop skill at work

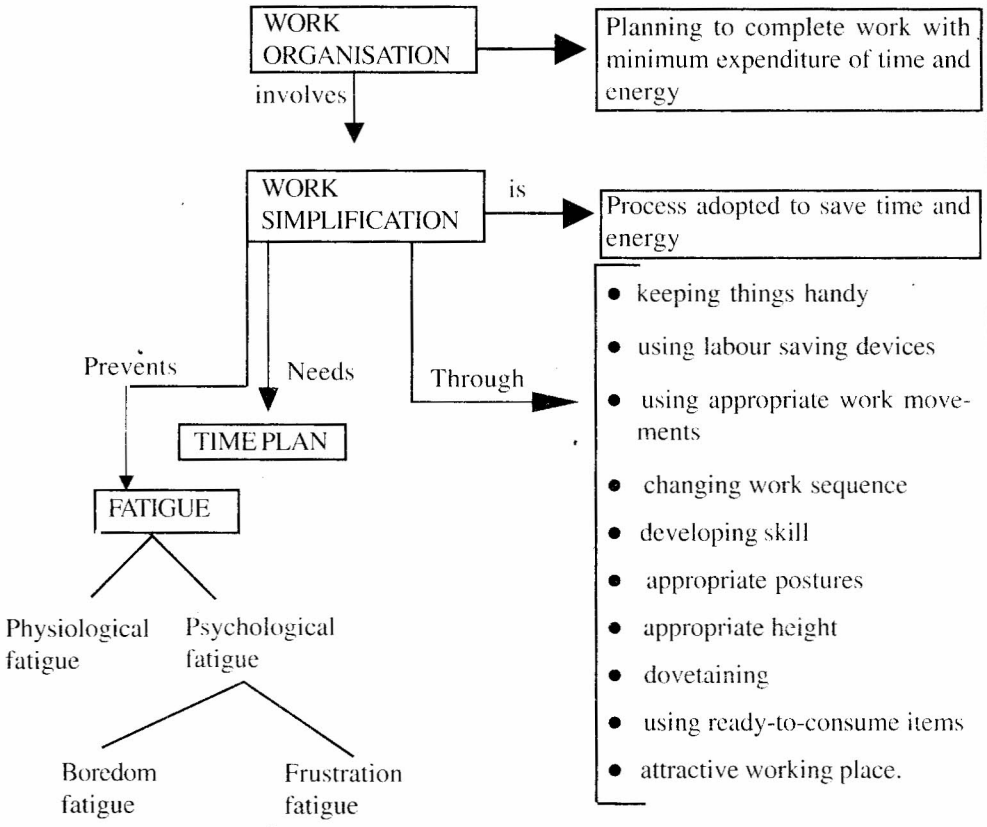
— make the atmosphere pleasant
— reduce mental tension
— appreciate the worker, and
— give rewards for good work.

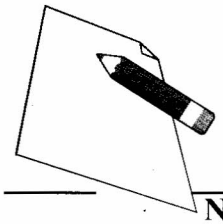
INTEXT QUESTIONS 11.4

Q. Rearrange the letters in the following words to denote:

(i)	feeling tired	IEFGAUT
(ii)	boredom fatigue	COHCYSPISLOGLA
(iii)	accumulation of waste material in muscles	LCIOOSPYHILGA
(iv)	desire to quit work	SUPERTARTNOIT

WHAT YOU HAVE LEARNT





Notes

TERMINAL EXERCISE

1. Your neighbour always complains that she cannot finish her work in time. What are your suggestions to her?
2. List the steps involved in making a time plan.
3. State the various measures one can take to simplify work.
4. Identify the different types of fatigue. Suggest some measures to overcome them.

ANSWERS TO INTEXT QUESTIONS

11.1 (i) F, (ii) T, (iii) F, (iv) F and (v) T.

11.2 1. (i) energy
(ii) stress/tension
(iii) less
(iv) Heavy

2. (i) moderate (ii) moderate (ix) light
(iii) light (iv) heavy (x) heavy
(v) heavy (vi) moderate
(vii) moderate (viii) light

11.3 1. (i) (c)
(ii) (b)
(iii) (d)

11.4 (i) FATIGUE
(ii) PSYCHOLOGICAL
(iii) PHYSIOLOGICAL
(iv) FRUSTRATION

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12

321en12

SPACE MANAGEMENT

Sita and Annie are both living in two bedroom apartments with their respective families. Not only is their family structure the same but their furniture and furnishings are also quite similar. Yet when you walk into their houses one looks more spacious than the other. Have you ever experienced this kind of feeling in some houses? Do you think: it is only a feeling? Or do you consider this to be real? Well! you are right. The same type of houses can appear to have more space or less space depending on how a person has organised it. In this lesson we will discuss what space organisation means and how we can achieve it.

OBJECTIVES

After studying this lesson you will be able to:

- state the meaning and importance of space management;
- define the term 'work centre' and explain its significance;
- list various activity areas in a home and specify their role in space management;
- use multipurpose furniture for effective space management in the home;
- arrange things aesthetically to create a pleasant atmosphere.

12.1 MEANING AND IMPORTANCE OF SPACE MANAGEMENT

You have already learnt in the previous lesson that space organisation is necessary to save time and energy. Space organisation means assigning space to an activity and systematically arranging all the materials required for it.

Thus, the important aspects of space organisation are-

- allotting space for the activity
- making available on the spot all that is required for the activity

- arranging systematically all the materials and equipment required for the activity.

It is desirable that all the materials required for performing a specific task are stored nearby so that you do not waste your time and energy in collecting the materials and storing it back. Such an arrangement for storage is termed as **functional storage.**

Also, if two or more activities need to be performed nearby then their working areas can also be organised in such a way that they can be performed simultaneously. For example, if you want to wash utensils while the food is being cooked and the water arrangement is in the kitchen, then both the tasks can be completed simultaneously and effectively. But if water source is at a distance then unnecessary movements have to be made while doing the two jobs together, or one will have to be performed after the other.

Moreover, when space in the house is limited it should be effectively utilised. For instance, a bedroom is usually used only at night for sleeping. Therefore, it is vacant during the day when it can be used for studying purposes. Similarly, the living room can be used for sleeping at night. For this purpose some specific arrangements need to be made to perform these additional activities effectively. You will study about this later in the lesson.

12.2 ACTIVITY AREAS IN A HOME

Observe various activities that are performed in your house and make a list of all these activities. Compare it with the following list.

- Cooking
- Washing: clothes and utensils
- Sleeping
- Studying
- Playing and watching TV, listening to radio
- Entertaining

Most of the above activities can be broken down into sub-activities. For example, cooking comprises of:

- storing of food stuffs
- pre-preparation, e.g., washing and cutting vegetables, kneading flour
- cooking and giving finishing touches
- washing utensils
- serving of food and storage of leftovers.

Therefore, the provisions required for cooking would be:

- raw materials like groceries, vegetables etc.
- utensils
- source of water
- preparation area
- cooking range, stove and fuel
- storage area
- holding area for cooked and leftover food.

Similarly, consider the activity area for washing clothes. We would need:

- provision for water
- provision of materials required for washing, such as soaps, detergents, blueing agent, starch, etc.
- bucket, mug and brush
- if washing machine is being used then provision of an electric point near it.
- arrangement to collect soiled clothes
- provision for clothesline and pegs or a clothes rack for drying.

In fact all the household activities can be divided into a number of smaller sub-activities. Doing this exercise of analysing each activity is important because it helps us to know the nature of the activity and work out the necessary requirements for these activities.

INTEXT QUESTIONS 12.1

1. List two important aspects of space organisation.
2. Give any two examples other than discussed in the lesson, where two activities can be dovetailed.
3. List the provisions needed for a study area.

12.3 WORK CENTRES

Now you are well aware of the fact that each activity performed at home has specific requirements and it would be best performed if it has a working area specified for it. The area specified for an activity is known as the work area or **work centre**. From our earlier discussion you must have understood that by work centre it is not implied to provide a separate room for every activity. With the space constraints in most modern houses, it is not possible to have so many rooms, so it is desirable to link two or more similar activities which can be performed in a

particular room. All that you need to do is to allocate space for each of the activities in that room.

12.4 SPACE MANAGEMENT FOR FAMILY ACTIVITIES

We will now discuss the specific requirements of some of these work centres for various household activities.

i) Cooking Area

The cooking area is usually called a kitchen where all the cooking related activities are performed. Study the kitchen in your house and judge for yourself whether the arrangements made are satisfactory or do they need some change.

In the kitchen you need to store equipment and things which are required daily and those which are required less frequently. But there is a need to store everything in the kitchen. Therefore, you tend to store them at different heights depending on the need. The things that are required most often should be stored at a height most conveniently accessible to you so that you do not have to unnecessarily bend or reach high to pick up what you need. The heavier and frequently used things like atta and rice containers are usually stored at floor level to avoid lifting these containers from a height. Things used occasionally may be stored at a height above normal reach. This is called **dead storage**. You can observe all these storage arrangements in the Cooking Area.

This arrangement of work space will depend upon whether it is a sitting or standing kitchen. You can observe this difference in Fig. 12.1and Fig. 12.2.

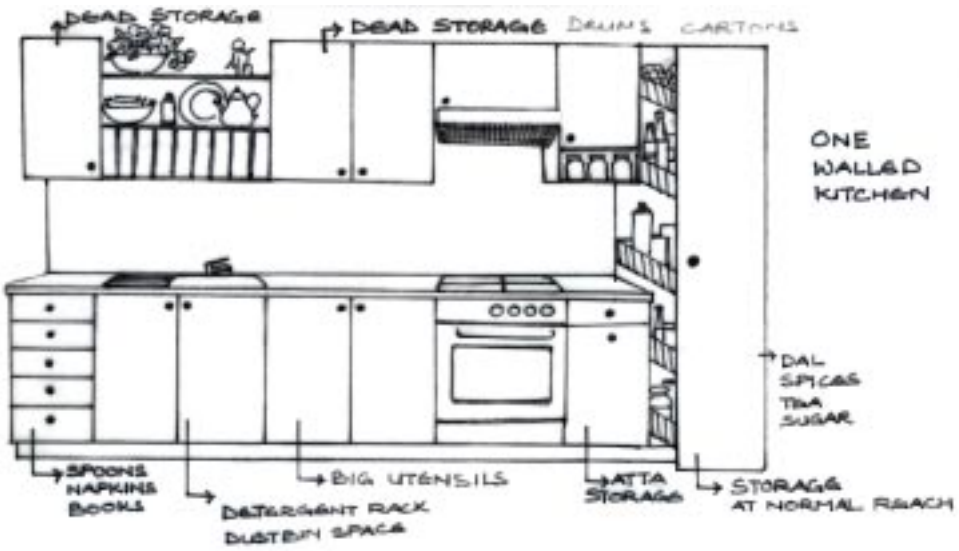


Fig. 12.1: Elevation plan of a standing kitchen showing various storage arrangements

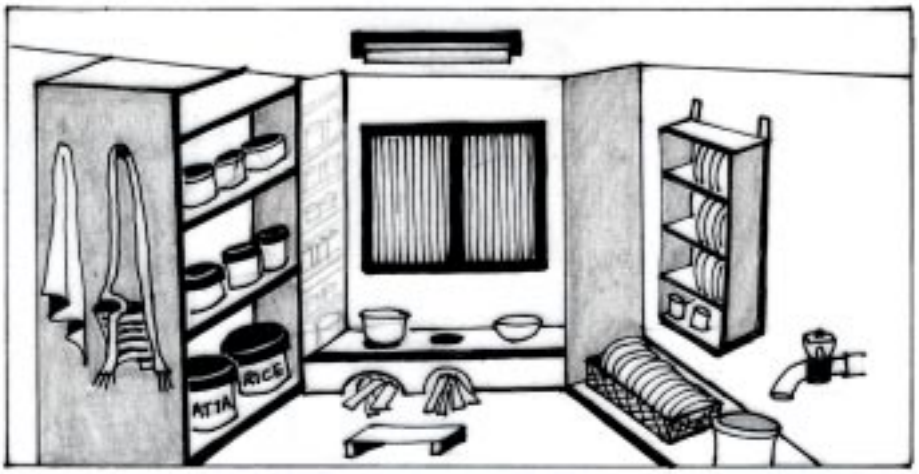


Fig. 12.2: Elevation plan of a sitting kitchen with various storage arrangements

The pre-preparation area can either be inside the kitchen or some of this work can be done outside. For example, in the dining area or in the living room, while watching television, one tends to cut vegetables or pick pulses. However, proper care should be taken that after finishing the work the place is properly cleaned.

After cooking, the food is served. The food can either be served in the kitchen if there is enough space or there can be a separate dining area outside the kitchen. If there is not enough space in the kitchen to keep the dining table, a folding dining table fixed in the wall can be used. Whenever required, the table can be opened and used. Further, the place in the wall behind the table can be used for storing crockery, cutlery, etc.

Fig. 12.3: Folding Dining Table

Utensil washing area should also be near the cooking area as far as possible because water is required at each stage of cooking - pre-preparation, preparation, serving and cleaning. If there is no regular water supply then a provision can be made for storing water in or near the kitchen.

Depending on the space available all the above provisions need to be made there. There are various layouts for kitchens in which these arrangements can be made. In these layouts, the work centres are arranged in the following ways:

One-walled Kitchen: In small houses, such a kitchen is provided where all the arrangements for preparation, cooking, storing and washing are made on one wall only.

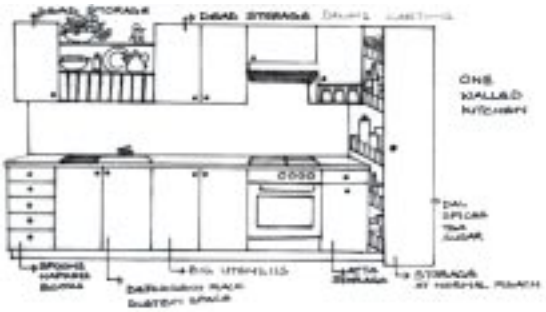


Figure: 12.4: One Walled Kitchen

Fig. 12.5: Two walled Kitchen

Two-walled Kitchen: Here two walls facing each other are used for the kitchen arrangements.

L-shaped Kitchen: Here two adjascent walls are used for kitchen arrangements.

Fig. 12.6: L-Shaped Kitchen

Fig. 12.7: U-Shaped kitchen

U-shaped Kitchen: Here three adjoining walls are used for kitchen arrangements.

ii) Bathing Area

Fig. 12.8: The Bathroom

Washing of clothes and bathing are usually done in the bathroom. Therefore, a bathroom needs storage area for soaps, washing powders, oils, other toiletries and bath linen. In addition, it needs to have proper water supply and drainage facility. The floor of the bathroom must have a slope leading to the main drainage point. The floor should also be non-slippery.

Care should be taken to locate all electrical points in a manner that they are away from water source to prevent any accident.

If a washing machine is used for washing clothes then there should be provision for keeping it in the bathroom or in an area specially assigned for washing clothes. Adequate arrangement must be made there to store soiled clothes so that you do not have to collect them from every nook and corner of your house.

The area for drying the clothes, i.e., the clothesline should be near the washing area so that unnecessary movement between washing and drying area is avoided.

INTEXT QUESTIONS 12.2

1. Make a critical analysis of the following statements.
   (i) One area should be alloted for performing one activity only.
   (ii) Materials and equipment required frequently should be stored at a convenient height.
   (iii) A folding dining table fixed in the wall is recommended for meeting space constraints.
   (iv) Arrangement of areas for pre-preparation cooking and washing should be as near each other as possible.

(v) The bathroom floor should be highly polished to look clean.

(vi) Electric points can be placed anywhere in the bathroom.

2. (a) Draw a diagram of your kitchen to indicate storage of various items. Suggest two changes to have more efficient storing.

(b) Draw any two kitchen layouts.

Activity 12.1 : Observe your kitchen. Suggest four changes in the organisation of work centres to improve efficiency.

(iii) Sleeping Area

Sleeping area is usually allocated in the bedroom. The bedroom is meant for resting, sleeping and dressing. In addition, it can also be used for study purposes. Proper arrangement of a study table, light and space for storing books will have to be made for it.

If the bedroom is small, then the beds can be so made that the childrens' beds can be under the big bed and pulled out whenever required.

Also, bunk beds and folding beds can be used. Or an ordinary charpoy can be used which can be moved out when it is not required.

In the bedroom, the beds can have boxes or drawers which can be used for storage in place of cupboards or shelves. For easier cleaning under such beds, these can be provided with wheels. Enough space on both sides of the bed should be left in order to facilitate the making of the beds.

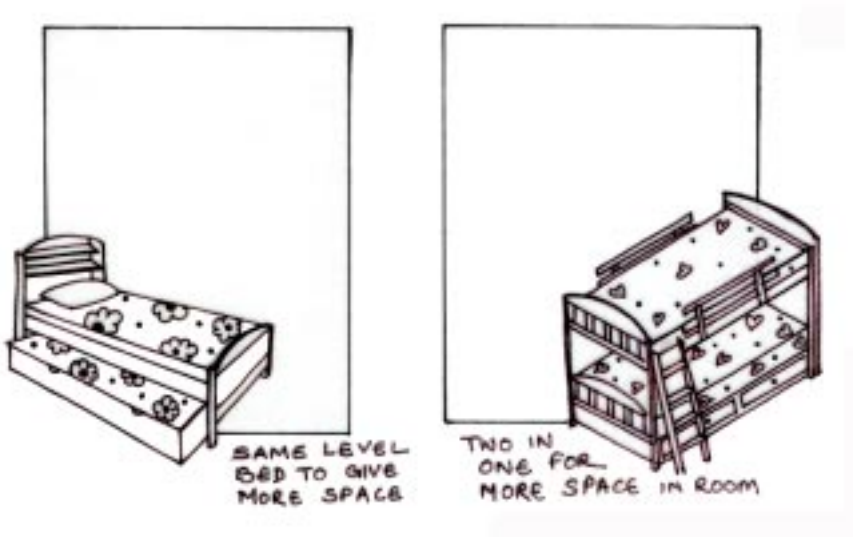


Fig. 12.9: Pull-out Beds

The side tables can be used on either side of the bed for keeping small items required regularly, like table lamp, watch, books, water, etc. Instead of a dressing table, a mirror can be fixed on the wall to save space.

Provision for a study table can also be made in the bedroom. It can be in the form of a proper study table or a folding table which can be opened when required. This study table can also be like the dining table fixed in the wall about which you had studied earlier. Here the wall space can be used for storing books and other stationery items.

The almirah or wardrobe can be built in the wall and up to the ceiling level. It will cover less floor space and provide the needed storage space.

If the sleeping area is to be provided in the living room itself, as in the case of one room apartments, then a diwan and folding beds can be provided for sleeping.

(iv) Study Area

The study table should be placed where there is a provision for good natural and artificial lighting with least disturbance.

It can be in the bedroom as discussed earlier or it can be clubbed with the dining room using the dining table for writing. A bookshelf or cabinet can be accommodated on or along the wall to keep books and stationery.

(v) Entertainment and Recreation Area

Entertainment area is where all members of the family get together, chat, watch TV, or do any similar work. This can either be in the drawing room or there can be a separate living room or a living cum bedroom.

Formal entertainment should be in the drawing room. If this room is large enough, it can be divided into two parts - one for sitting purpose where sofa sets, chairs, tables, etc. can be arranged and the other for dining. The divider between the two areas can have shelves which can be used for displaying or storing various things.

If the divider has the arrangements of a folding dining table in it, then the space of the room can be used as living room or children's play room.

As mentioned earlier, the living room can also be converted into a guest room at night where folding beds can be spread out as per requirement. Further, the furniture can be so provided that the living room, can be used for sleeping at night. A sofa-cum-bed can be used as a sofa during the day and converted into a bed at night.

Fig. 12.10: Sofa-cum-Bed

12.5 CONCEPT OF A ONE-ROOM HOUSE

You have learnt that different rooms are used to perform various household activities. But if the house consists of just one room then all the work centres have to be adjusted in that room. Can you make a sketch to show the possible arrangement of various work centres in one room?

Well, one such arrangement could be as follows.

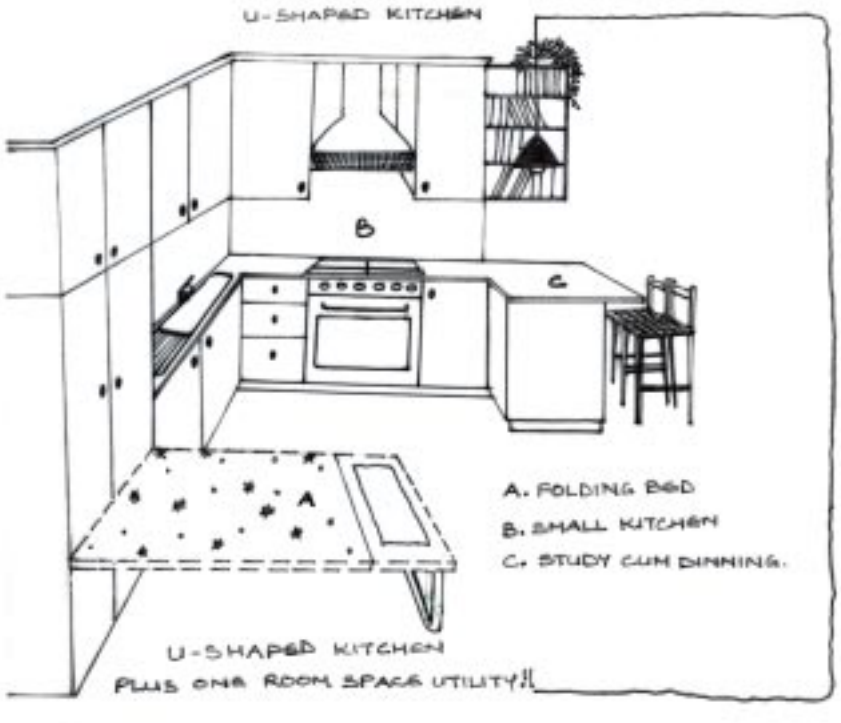


Fig. 12.11: Possible mangement of work centres in a one-room house

12.6 GUIDELINES FOR MAKING WORK CENTRES MORE EFFECTIVE

Certain common guidelines can be followed for making the work centre more effective. They are:

- Arrange work centres in a sequential order to assist in smooth flow of work. For example, in a kitchen, the order of work centres could be prepreparation, washing, cooking, and serving.
- Have transparent storage containers or keep them properly labled.
- Provide adequate lighting and ventilation in all work centres.
- Make all work centres easy to clean and maintain.
- As far as possible, prefer built-in storage to storage cabinets and cupboards that occupy floor space.

- Create additional storage space under the staircase, below the window slabs, and as lofts.

INTEXT QUESTIONS 12.3

1. Suggest four space saving furniture items for sleeping purposes.
2. Give suitable ideas for managing the following activity areas:
   (i) studying
   (ii) entertainment
   (iii) bathing
3. Save work area can be used to perform different kind of activities. Explain giving two examples.

Activity 12.2 : Collect at least ten pictures of multipurpose furniture for different rooms in a house. Prepare a scrap book using these pictures. Also mention special features of the furniture.

12.7 RELATIONSHIP BETWEEN SPACE ORGANISATION AND AESTHETICS

Whenever we are organising space for performing various activities, our aim should not only be that the center is functional but it should be attractive too. This is true for all the rooms in a house, including kitchen and bathroom. All rooms should be aesthetically appealing. If a place is appealing, you want to sit and work there. It also helps in better performance of the activity. Some of the points which can be considered for making the work centres attractive are:

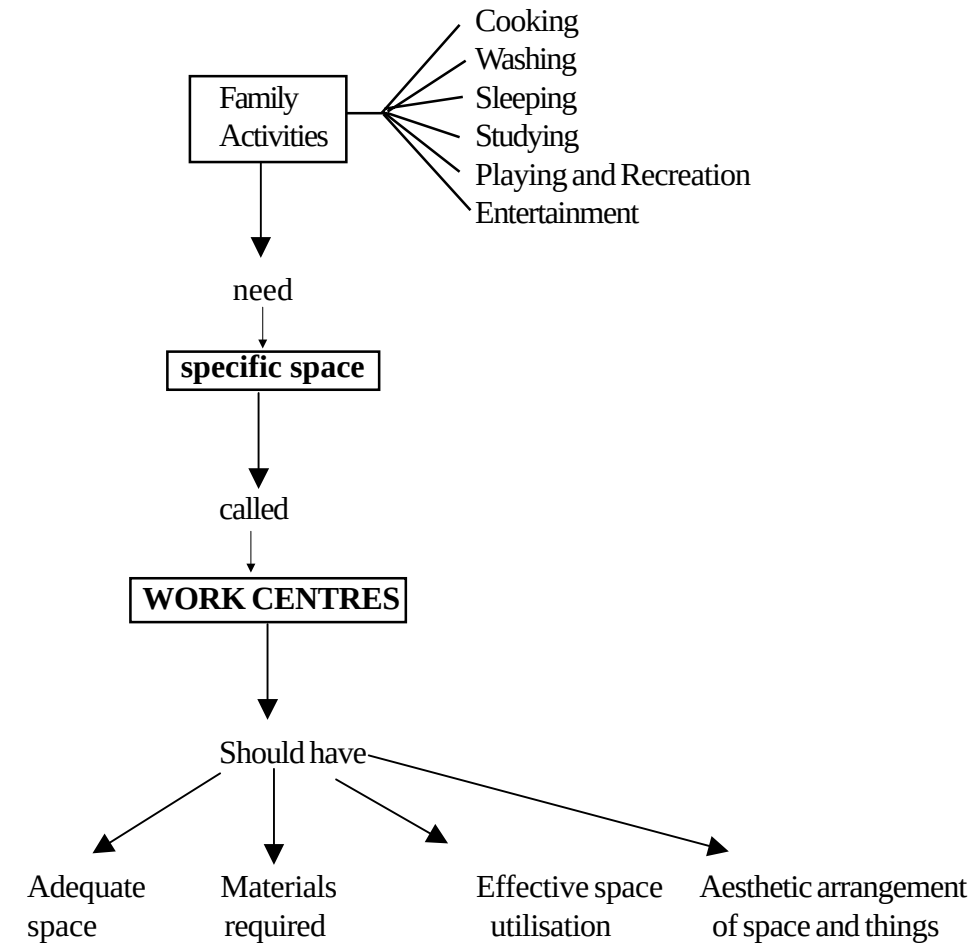
- The size of the furniture – in accordance with the size of the work centre. Small and light furniture is desirable in a small room.
- Organised look – the place looks tidy and attractive if things are stored away when not in use.
- The arrangement of equipment, furniture, fixtures and other things – must not hinder the movement of the people.
- The arrangement of furniture and equipment in a room – in accordance with the activities performed there.
- Lighting – a well lit small room will appear bright and spacious as compared to a large poorly lit room.
- In a one-room apartment, all the work areas should be so arranged that they can be distinguished from each other.
- Colours – can also help to improve the work centre aesthetically. For example, dark and small rooms will appear bright and big if light colours are used, and the ceiling is painted white.
- Placement of suitable decorative items and indoor plants – will add appeal to the room.

INTEXT QUESTIONS 12.4

1. List the things that add to the efficiency of the worker.
2. Size of the rooms has no bearing on the size of the furniture things Comment.
3. Why should all the equipments and fixtures required for a job be placed in the work centre?
4. What is the role of colour in decorating a room?

Activity 12.3: Visit your neighbour's house and make a note of the features in the drawing / living room and kitchen that make them aesthetically appealing.

WHAT YOU HAVE LEARNT



TERMINAL EXERCISE

1. What do you understand by space organisation? Explain its significance.
2. Differentiate between functional and dead storage.
3. 'All major family activities can be divided into sub-activities.' Explain with the help of an example.
4. What do you understand by the term 'work centre'?
5. Mention the specific requirements of the sub-centres for the following

   - cooking area
   - play area for children.
   - bathing area
6. List the guidelines for making a work centre more effective.
7. What can be the other uses of the bedroom besides sleeping and what provisions need to be made for these activities?
8. What are the various changes in furnitures and fixtures that can be made in a one room house to make provision for all the work areas of the house?
9. Enumerate the benefits of aesthetics in work area. Suggest various ways in which the work area can be made attractive.

ANSWERS TO INTEXT QUESTIONS

12.1 1. See text

2. - Washing clothes + baking cake
   - Knitting + watching T. V.
   - Cutting vegetables + watching T.V.
   - Cooking vegetables + washing utensils

12.2 1. (i) No, more than one activity can also be performed one area for effective utilization of space eg – living room can be used for sleeping at night.

(ii) Yes, this reduces work thus saving time and energy.

(iii) Yes, when not in use it can be folded away giving ample space for movement.

(iv) Yes, these are related activities and can be easily dovetailed. This will save both time and energy.

(v) No, that might result in a slippery floor, which can cause accidents.

(vi) Electric points in the bathroom should be kept away from water sources.

12.3 1. Folding bed, trunk beds, diwan, sofa-cum-bed, pull-out beds.

2. Refer text.

12.4 1. (i) False

(ii) False

(iii) True

(iv) True

(v) False

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13

321en13

INCOME MANAGEMENT

For the first time, when Meena got her pocket money, her mind started thinking of all that she wanted. She at once began to think of her requirements for the month. She wanted to enjoy an ice-cream also with her money. Soon Meena realized that her money was not enough to meet her requirements, as well as provide her with an ice-cream. The problem that Meena was facing now was to decide upon how to use the money, so that she could satisfy her needs and her desire for an ice-cream.

You may have also faced a similar situation in your life. Money that you have may be your pocket money or your monthly income. You must have also wished that your money could 'stretch' to satisfy all that you needed and desired. Wishing is not the solution to such a problem. The solution lies in the planned utilization of money.

In this lesson, you will learn how to plan the use of your money.

OBJECTIVES

After reading this lesson, you will be able to:

- define the term 'family income' and discuss its components;
- enumerate the guidelines for preparing an expenditure plan;
- explain the term 'income management' and discuss the process;
- maintain a record of family income and expenditure;
- discuss the need and methods of supplementing family income;
- explain the concept of 'saving' and 'investment';
- discuss the role of financial institutions in money management;
- select a suitable investment scheme on the basis of certain characteristics.

13.1 FAMILY INCOME

As the name suggests, income means anything which comes into the family and which is used to satisfy the needs of its members. What comes into the family? You may just say "money". But, besides money, there are also goods and services, which may flow into the family and may be used for the same purposes like money. Thus you can now define income as:

Fig. 13.1

> Income for a family comprises of money, goods and services that are available to the family to fulfill its needs and desires.

Let us learn more about these.

Money

Money is the hard cash you get in hand. It is generally called money income. It may be obtained from various sources such as :

- from your place of work, e.g. service, business
- from rent, if you have given whole or part of your house on rent
- from the interest that you get by putting your money in a bank account
- from household production e.g. making pickles, toys and garments, which you sell.

Goods and Services

Your family may also enjoy various goods and services such as:

- the house you stay in, may have been provided free of cost by your employer or Government.
- your car may have been provided by your company
- your kitchen garden may give you a good produce of vegetables
- you utilize your energy to do household chores, instead of employing paid help
- you stitch clothes for your family, instead of getting them tailored
- you take regular care of your equipment. As a result, not only will it provide you better service, it will also save on repairs.

These goods and services enjoyed by your family are collectively known as real income.

Family income = money income + real income

Needs

Needs are deficiencies which must be fulfilled. You need food to live and keep healthy. You need clothing and shelter to protect your body.

Food, clothing and housing are therefore, your basic needs. They are the needs which help you survive. There are other needs which make your life easy. For example, to move from one place to another easily, you will require a bus, a cycle, a scooter or a car. But if you have none of these you will walk. Bus, cycle, scooter or car make it easy for you to commute.

Make a list of some other needs which help make your living easier.

Desires

When all your needs are fulfilled you begin to think of meeting your desires. What you desire is not really needed to carry on life, but still you wish to have it. For example, you may desire to have some wall hangings for your house or you may like to have a three bedroom house in a particular locality.

You may say, needs are those requirements which are needed to make life easy while desires are things which you feel happy to possess. With money, you can buy all that is required to satisfy your needs and desires. Your need of a fan and your desire to have a carpet - both can be bought with money. Your needs and desires can also be fulfilled by the goods and services available to your family. Your need of a house may be fulfilled by the company in which you work. Your desire to have a well-tailored dress may be fulfilled by the use of your own or your mother's skill.

Activity 13.1: Find out the sources of income for your family and any two other families known to you. Record and compare them with the list given in your text.

INTEXT QUESTIONS 13.1

1. Analyse and state whether the following are sources of money income (MI)or real income(RI).

   (a) Making pickles for your family (.....)

   (b) Growing vegetables and selling them (.....)

   (c) Baking cakes on order (.....)

(d) Stitching your own clothes (.....)

(e) Students coming to you for tuition (.....)

(f) Cleaning your car everyday (.....)

(g) Getting interest from the money deposited in bank (.....)

(h) Attending to electrical repairs of your house yourself (.....)

(i) Being provided with a scooter by your company (.....)

2. Read the following paragraph and then answer questions (a) and (b)

Mr. Lal and Mr. Anand both get a salary of Rs. 5000 each. Mr. Lal's office provides him with free lunch as well as petrol expenses for his scooter. Mr. Anand's office has provided him a free living quarter, near the office.

(a) Which of the two men are enjoying a higher income?

(b) Give the reason for your answer.

13.2 EXPENDITURE

Expenditure is the money spent on buying different goods and services, required by the family.

Goods

You need various things for your daily living. For example, you need food items, pots and pans to cook the food in, soap to wash dirty clothes and an iron to iron your clothes. If you look around in your house, you will see various goods, each one of which is useful to you.

Make a list of goods you have in your bathroom.

Services

Services are utilities, which make your living easy. For example, you want to talk to a friend living in a different city. You need not visit her. You can telephone her, sitting at home. Besides telephone services, what are the other services you enjoy in your house? Yes, electricity and water service. If you want to go out to work you have the service of public transport available to you. If you ever fall sick you can go to a government hospital. Some other services that all are availing of are the police protection, fire services and sewage disposal.

Look around your locality and see what services it offers you.

All these goods and services have to be paid for. The money which you spend on them is known as **expenditure.**

13.2.1 GUIDELINES FOR PREPARING AN EXPENDITURE PLAN

If you want to get good returns from the money you spend then you need to make a spending or an expenditure plan. A spending plan tells you how to spend your money judiciously. You need to consider the following while making such a plan.

- The money income which you get in hand, has to be divided into various areas of expenditure such as food, clothing, housing, education, transportation, household services entertainment and savings.
  - As you have learnt earlier, food, clothing and housing are your basic or primary needs. The rest of the above mentioned needs are your secondary needs. Obviously, while spending money, you will first consider your primary needs.
  - The way you divide your money for spending will depend upon the importance you give to the various areas of expenditure. For example, if you give more importance to clothes than food, you will keep aside more money for it. You may spend less money on education, if you feel it is not very important for your family.
  - Make sure that the amount of money you keep for each area is sufficient to cover the expenses of that area for the full month. For example, if you have kept aside Rs. 1000 for food it should suffice you till the end of the month.
- If you have money left over after your primary and secondary needs are met, you can think of fulfilling some desires. Desires will first include some comforts for your life. If money is still left over, it may include some luxuries. Comforts are more easily affordable than luxuries. The following example will help you to understand this.

  Once your need for a house is fulfilled, you will want to buy things which will make your house comfortable. You may buy a desert cooler or a fan. When most of your comforts are met you may think of luxuries for yourself. You may now buy an air-conditioner.

Thus you can summarise the order of satisfying needs and desires as follows:

Fig. 13.2
Primary needs

Fig. 13.3
Secondary needs

Fig. 13.4
Luxuries

- While your present needs and desires are being fulfilled, you also need to think of your future needs. There may be some needs in the future, the fulfillment of which, requires a large sum of money. For example, a marriage. Your regular income at that time may not be enough to fulfil that need. What would you do to help yourself in a situation like that? Yes, you can keep aside, some part of your money income for such future needs. This is known as **saving**. To be able to save ensure that at all times your total expenditure is less than your total income.

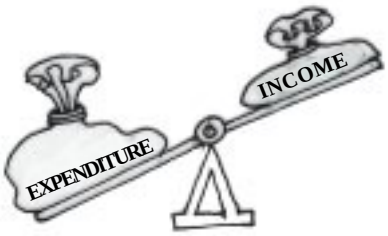


Fig. 13.5

INTEXT QUESTION 13.2

1) Mark a tick (√) on the item on which you should spend first. Give a reason for your choice.

   (a) Going out for a holiday or buying a refrigerator.

   (b) Buying ice cream or buying nutritious food for your children.

(c) Buying a mixer grinder or replacing ordinary curtains with fancy ones.

(d) Buying enough warm clothes for winter or buying a vacuum cleaner.

(e) Buying a house or arranging for a holiday abroad.

13.3 INCOME MANAGEMENT

> Income management is the planned and controlled use of the family income.

You have read about the various areas of expenditure in a family which have to be met with your money income. The income needs to be spent in such a way that money is available for expenditure throughout the month. This process of distributing money over various items of expenditure is called income management.

13.3.1 PROCESS OF INCOME MANAGEMENT

In lesson 10 you have learnt about the steps and process of management. Let us see now how we can apply those steps for income management.

Planning the use of the family income: You have already learnt about this while learning to make the spending plan of your income. Make sure you keep away a part of your income as savings, while you plan your expenditure.

Controlling the use of the family income: You can control and keep a check on your expenditure in two ways:

(i) Make sure that money is not wasted. For example, buy just the right quantity that is required by the family and avoid wastage. Buy from co-operative stores or wholesale markets, where things are cheaper, to save money.

(ii) Make use of your time, energy, skill and knowledge to cut your expenses. Do you remember what is this known as? Yes, you are right, it is real income. If the use of your income is well planned and controlled, your needs, as well as your desires, will be fulfilled.

There is no readymade plan for using money. Families with identical incomes will not necessarily have identical needs and desires. For example, two families, each earning Rs.5000 per month will not be having the same needs and desires because one may be staying in a village and the other in a city. Their management of income will, therefore, be different, i.e. based on their own needs and desires.

13.4 MAINTAINING A RECORD OF INCOME AND EXPENDITURE

Now that you have made a spending plan for your family, it is important to ensure that the plan is carried out carefully. In order to do this, it is necessary for you to have some control over the spending of money.

Fig. 13.6

One simple way to have control could be to maintain a record of the income and daily expenditure of your family.

A sample of the daily record is given below:

Table 13.1 Income and Expenditure Record

Date	Income in Rs.	Item Purchased	Quantity	Rate	Amount Spent in Rs.	Balance
1.2.07	5000	Rice	15 kg	Rs 10/kg	150	
		Atta	20 kg	Rs 10/kg	200	
		Sugar	5 kg	Rs 15/kg	75	
		Butter	1/2 kg	Rs 106/kg	53	
					478	4522
2.2.07		Rajmah	3 kg	Rs 30/kg	90	
		Oil	5 Litres	Rs 52/lt.	260	
		Soap powder	1/2 kg.	Rs 110/kg	55	
		Dress piece	2m.	Rs 60/m	120	
					525	3997
3.2.07		Ghee	2kg	Rs 60/kg	120	

You can use a notebook or a register to write this day-to-day account. Details like quantity, rate and the amount spent on the items purchased can be recorded in separate columns. This income column is important in a family where income flow

is irregular or where there may be 2-3 sources of income. The balance column, if filled in daily, will tell you how much money is left at the end of each day. To get your balance for the day, add all the expenses of the day and subtract the total from the balance of the previous day. For example, in Table 13.1 the total amount spent on 1.2.04 is Rs. 478.

Therefore, income minus total expenditure of the first day, is Rs 5000 - 478 = Rs 4522

The total amount spent on the second day is Rs 525. Your balance at the end of the second day would be the previous balance minus total expenditure on the second day, or Rs 4522 - 525 = Rs 3997

You will observe that the figure in the balance column will decrease day by day. How do you feel, when the money in your pocket keeps decreasing? Yes, you are reminded to put a check on any unnecessary expenses, or any other item not listed in your spending plan.

13.4.1 ADVANTAGES OF MAINTAINING A RECORD OF INCOME AND EXPENDITURE

Maintaining a record of expenditure helps you in the following ways:

- Understand your expenses to know exactly how much is being spent and on what.
- Check unnecessary spending - A look at the balance figure will remind you to spend only on what is really needed by your family.
- Compare the expenditures of different months - if your expenses for this month are higher than last month you will know exactly where and why you have spent more.
- Plan for the future - regular maintenance of accounts makes it easier for you to know how much money would be required for the various items in the future.
- Be well informed of market trends - the rate column shows you when and how prices rise in the market.

INTEXT QUESTION 13.3

1. State whether the following are true (T) or false (F). Justify your answer.
   a. Management of income is important only when you have a large income.
   b. When you have a small income it is managed by itself.
   c. When needs are too many income management is out of question.

d. When desires are too many income management is useful.

e. First step in income management is to make an assessment of your income.

2. Mr. Singh's salary is Rs 10,000. If his total expenditures for the first 9 days of are Rs 2156, Rs 1099, Rs 756, Rs 644, Rs 500, Rs 300, Rs 402, Rs 650.and Rs 806 respectively, calculate the balance of his salary on the 10th day.

Activity 13.2: Keep a record of income and expenditure of your family for two months and compare the expenditure on various items.

13.5 WAYS OF SUPPLEMENTING INCOME

If you belong to a family where the regular income is not enough to cover all the expenses of a family, what would you do? Obviously, you would try to add to your regular income in some way or the other.

Adding to the income means supplementing family income.

How do you do it?

Some of the ways of supplementing income are as follows:

- Adopt any income generating activity: Women sometimes make pickles and jams at home and then sell these. Using their skill, time and energy while at home, they earn money to provide some income. Some women stitch clothes on order, some knit, make stuffed toys or give tuition. Any activity which helps in bringing in some extra money is called an income generating activity.
- Take up a part time job: in your neighbourhood, you may have seen some boys, girls or women taking up jobs in homes or shops for two hours/day or half a day only. They may be babysitting or maintaining accounts or doing any other work. Such jobs for a limited period of time are called part time jobs and bring lesser amount of money as compared to the regular full time jobs. But such jobs are spare time jobs and are good for supplementing family income.
- Invest savings to earn interest: If you have money, invest it. By investing, you not only keep your money safe and away from the temptation of spending, but also earn interest on it which can be added to your monthly income.
- Make wise use of available resources: If you have a big house, a part of it can be given out on rent. Your tractor may not be needed by you all the time. You could let another farmer use it, on payment.

Supplementing family income does not merely mean bringing in more money. Cutting some expenditure on items like enterainment, going on holidays; doing your

cleaning, washing and ironing yourself are some of the ways of saving expenditure. You know that "money saved is money earned"!

Activity 13.3: If you are talented in cooking you can use your skill to earn some extra money. Suggest at least three ways in which you can use your talent for supplementing your family income.

INTEXT QUESTIONS 13.4

1. Comment on the following statements. Justify your answers (at least two points).

   (a) Using a part of your house for commercial storage is a way of earning money.

   .....

   .....

   (b) Engaging a servant for doing household chores in order to take up a part time job is a good choice to earn extra money.

   .....

   .....

   (c) Getting a full time job is always better than getting involved in income generating activity at home.

   .....

   .....

   (d) An income generating activity is the only good answer for supplementing family income.

   .....

   .....

13.6 WHAT ARE SAVINGS AND INVESTMENTS?

As you have learnt earlier, saving for any month is the part of family income that is deliberately put away for future use in. The soaring prices and the increasing needs and desires of the family members make it difficult for the homemaker to save. But it is the duty of every household to plan their expenditure and thus put aside some money from the present income for future use. This money, accumulated over the months, accounts for the family's savings.

> Money from the present income that is put aside for emergency or future use is known as savings.

13.6.1 NEED FOR SAVING

Irrespective of the income group you belong to, you must save. There are several reasons for you to save. Some of them are preditable while others are not. Some of the reasons for saving are:

- **For a secure future :** After retirement there may be no source of income or pension which is anyway much less than one's regular monthly salary. The expenditure of the household remains more or less the same. Savings can help bridge the gap. One feels comfortable if one has some income from savings. This comfortable feeling will be felt even more by people in non-pensionable jobs, where the income becomes nil.
- **For meeting emergencies:** Someone in your family may suddenly become seriously ill or may meet with an accident. In either case, the person may require immediate medical attention at home or in hospital. You need to save for such unforeseen situations.
- **Fulfilment of family's goals:** Savings are also required for fulfilling a family's long term goals. For example, some of the goals of your family may be to buy curtains, to provide fancy clothes for the family, to buy a house, a car or a tractor. The former two goals can be achieved fast, as not much expenditure would be required for them. To buy a house, car or tractor, you would need a large sum of money. You will have to gradually save for a number of years, to be able to buy any of these.

Fig. 13.7 Fulfilling family goals

- **To raise the family's standard of living:** All of us always want to have more and better things for our house. Most of the articles which raise our standard of living, like washing machine or television, are expensive. Buying these articles from our monthly income may be difficult. You can start saving for them and buy them only when you have saved enough. If you wish to have these gadgets quickly, you can purchase them on instalment basis. You may ultimately pay more this way, but you also enjoy their benefits earlier.
- **For starting a small business or for self-employment:** You or any of your family members may want to start a small business. You need some capital or a lumpsum money to start with. Your accumulated savings will provide you the money needed.

13.6.2 GUIDELINES FOR SAVING

To accumulate savings, you need to plan carefully–

- Have a realistic saving plan - if you are earning Rs 5000, can you save Rs

2000? No. Your family's expenses cannot be met with just Rs. 3000. The amount you need can be saved gradually over a number of months in small amounts.

- Have a regular saving plan – if you want a large saving to accumulate, you will need to save every month for a few years.
- Be clear about the purpose for saving - if you know your goal for which you are saving, it becomes easier for you to save.

INTEXT QUESTIONS 13.5

1. Write two reasons for which each of the following families will save.

   (a) Mr. Lal, a middle-income man is working in a private firm. He has two college going daughters. Mrs. Lal is a heart patient.

   .....

   .....

   (b) Mr. and Mrs. Swamy are in their early forties. They have a school-going son, who wants to become a doctor. This middle-income family lives in a rented house. They wish to have a high standard of living.

   .....

   .....

   (c) Mr and Mrs Bose are a middle-aged couple having no children. Mr. Bose, a chartered account works in a private firm. They live in a rented house.

   .....

   .....

13.6.3 INVESTMENTS

You have learnt that your savings are not for present use. They are collected to be used at a future date.

If you keep your savings at home

- if does not grow
- there is a chance of if getting stolen
- there is a temptation to use the same to fulfill some present desire.

In order to avoid the above, put your savings in a bank or any other saving institution. Here, your savings are not only kept safe, but they also grow.

When savings are made to grow, it is called investment.

For example, you have saved Rs 10,000. If you keep this money at home, it will remain the same even after many years. But if you keep this money in a bank, it will earn interest and grow. The longer you keep it, the more it will grow.

There are a number of other ways in which you can invest your money. You will read more about them later in this lesson. But first you must understand how to choose an investment scheme out of the many available.

13.7 ROLE OF FINANCIAL INSTITUTIONS

There are a number of benefits of keeping your money in financial institutions:

i. They keep your money safe.

ii. They make your saved money grow by paying interest.

iii. You can withdraw your savings as and when you need them.

iv. They give you loans against your investments.

13.7.1 COMMON INVESTMENT AVENUES

You may invest your savings in any of the following institutions

(i) Bank

(ii) Post-office

(iii) Provident Fund

(iv) Life Insurance Company

(v) Unit Trust of India

(vi) Stock Exchange

(vii) Private Company

(viii) Property or jewellery

i) Banks

Money not required immediately and can be saved in a bank. The advantages of keeping money in a bank are :

- Your money is safe.
- Your money grows since you get interest on your deposits.
- You can withdraw money from the bank whenever you need it.

- You can take a loan against your money kept in the fixed deposit of your bank account.

How to open a saving accounts in a bank?

Your request for opening a saving account will have to be made on the prescribed form of the bank. Besides giving the relevant particulars, you will need to furnish the specimen of your signature and copies of two passport size photographs. You will need to be introduced to the bank by a respectable party, i.e. a customer, an employee of the bank or some other well known person. This way, the bank satisfies itself about your integrity, honesty and financial standing. After this, the bank will accept your initial deposit and give you the following:

- A pass book - it serves as a copy of your account in the books of the bank.
- Cheque book - it is to be used for withdrawing money from the bank.

The account may be opened by a single person or jointly by two or more persons. Either of the persons can operate the account. A nominee's name has to be mentioned. You can start a savings account with Rs. 1000 but this may be changed by banks at any time.

> Nominee is a person who would get the saved money in case the account holder dies.

ii) Post-office

Similar to a bank account, you can also save money in the post-office. Saving in a post-office has the following advantages:

- they are conveniently located
- you can start a savings account even with a very small amount, i.e. Rs 20.
- you do not have to pay income-tax on the interest earned in many of its schemes, like National Saving Certificates (NSC), Indira Vikas Patra, etc.
- you can also get rebate in income-tax by investing in many of its schemes. The method of opening an account is the same as that in a bank.

Activity 13.4: Visit a bank and a post office to find out the various savings schemes offered by them and the income tax rebate on the schemes.

iii) Provident Fund

To protect the salaried people in old age after retiring from service, the Government has introduced 'a retirement benefit scheme' called the Provident Fund Scheme. The main purpose of the scheme is to provide for compulsory saving out

of the current income of the employee. The employer gives the employee the saved amount together with the interest at the time of retirement.

While the money accumulates in the fund, the Government uses it for the development projects in the country. So, by investing in Provident Fund, you serve two purposes.

- you provide for yourself in old age, and
- you help in the development projects of the country.

The main features of Provident Fund are :

- Every month, a certain percentage of the basic salary is compulsorily deducted from the employee's salary. This deduction is the contribution towards the fund.
- An interest is worked on the contribution. A record of the contributed money and the interest earned on it is maintained by the employer. A copy of the same is also given to the employee.
- The money deposited and the interest on it are both exempt from income-tax.
- You can take a loan against the money deposited.

There are two types of Provident Fund Schemes:

- General Provident Fund (G.P.F.) - This is suitable for all salaried people. If desired, the employee can increase the contribution towards the fund. At the time of retirement, the employee gets both, the contribution and the interest, in a lumpsum.

If the employee needs money before retirement, say, for the marriage of children or for the construction of a house, a loan can be taken from the Provident Fund. The money withdrawn can be returned to the fund in easy instalments every month.

- Public Provident Fund (P.P.F.) - Any self employed person can open this account with the State Bank of India or the post office. The money may be deposited either regularly in instalments or in lumpsum. After five years, the investor can take back certain percentage of this money. The investor also enjoys income-tax relief. Loan can be taken against the money invested in the fund.

iv) Insurance Policy

Insurance is a means of providing security against loss caused by natural or man-made factors. When one takes an insurance policy, one has to enter into a contract with the insurance company. Under the contract, the insured has to pay a

sum of money known as the premium periodically to the insurance company. In return, the insurance company makes good the loss suffered by the insured person or agrees to make a compensation for the loss incurred.

Insurance is of two types:

- ***General Insurance***-This covers risks such as theft, fire, flood, drought or any other contingency. The contract is generally made for a year. The insured has to pay the premiums periodically. The amount of the premiums to be paid will depend on the amount for which the contract is drawn up. In case of a loss suffered by the injured, he or she can recover from the insurance company the actual amount of the loss or the amount of policy, whichever is less. The advantages of this policy are:
  - — it is an easy and forced form of savings and
  - — it provides security against loss or risk.
- ***Life Insurance*** - It is a contract under which the insured pays premium periodically. How much the premium will be, will depend upon the total amount of the policy and the number of years for which the policy is drawn up. At the end of the period, the money along with the interest, is returned to the insured. In case the insured dies, the full amount for which the policy is taken, is payable to the person whose name has been nominated by the insured. This person is called the beneficiary. The advantages are:
  - it is a safe investment
  - it provides financial protection to the dependents in the event of death or disability
  - it is an easy and forced form of saving
  - it provides income-tax relief on the paid-up premiums, and
  - loans can be taken against money deposited for the policy.

Activity 13.5: Find out the names of some policies offered by the Life Insurance Corporation of India and explain how they can help you.

v) Unit Trust of India

You can buy units in your name or in joint names from the Unit Trust of India (UTI). Each unit has a face value of Rs. 10. A minimum of 100 units has to be bought. Every year in June, the Unit Trust of India declares dividends out of its projects. The advantages of investing in units are:

- you get regular interest
- you get income-tax relief on the amount invested
- the divident you get is completely exempt from income-tax
- whenever you are in need of money, you can encash the units by selling them back to the UTI at the repurchase price fixed by it from time to time.
- you can transfer the units to another person, and
- it is a safe investment.

Note : The income tax benefits may vary from time to time according to Government policies.

vi) Shares

When private companies want to develop, they float shares to the public. When you buy a share, you become a part owner of the company. You will now share both the profit and loss of the company. When buying shares, you must buy from companies which you expect will do well, so that you enjoy profit and not suffer from losses as in the cases of less reputed companies.

The main advantage of this type of investment is that it may quickly give you a very high profit. But this is not always so. Do you watch the news on TV? The news will tell you that the Sensex has either risen or fallen. When the Sensex remains at a low level, you may lose money on your shares.

vii) Debentures

Debentures are also known as bonds. When you purchase a debenture from a company, it means that you have loaned the money to the company. In return, the company promises to pay back the investor not only the amount invested but also a fixed rate of interest on it at regular intervals.

When compared to investing in shares, this is a safer method of investment. You get your interest irrespective of the company's profit or loss.

viii) Property or jewellery

If you have a large saving you can buy any one of these and keep it with you. You can sell it at a later date when its price goes up.

The disadvantage here is that when you wish to sell off your property, it may take long time to get a suitable buyer. When you sell off your jewellery, a certain amount of loss may be faced in the weight of the jewellery. You can pledge gold or property for obtaining loans in cases of emergencies.

Depending upon various characteristics like safety, liquidity, return on-money invested, exemption from tax and availability of loan facility, most of the investment schemes can be plotted in a simple chart.

Table 13.2 Characeristics of Selected Investment Schemes

Institution	Safety	Liquidity	Return	Tax exemption	Loan facility
Saving Bank Account	√	√	√	—	only against Fixed Deposits
Post-Office Savings Account	√	√	√	√	—
National Saving Certificate (NSC)	√	—	√	√	—
General Provident Fund (GPF)	√	—	√	√	√
Public Provident Fund (PPF)	√	—	√	√	√
General Insurance	√	—	√	—	—
Life Insurance	√	—	√	√	√
Units	√	√	√	√	—
Shares	—	—	√	—	—
Debentures	√	—	√	—	—
Gold/ Property	—	√	√	—	—

Activity 13.6 : Find out the above mentioned characteristics of some other investment schemes in your area and add them to the chart given here.

13.7.2 FACTORS INFLUENCING SELECTION OF AN INVESTMENT SCHEME

Banks and saving institutions offer various investment schemes, suitable to various categories of people. Before you invest your money in any scheme, you must study the following points carefully.

- **Your capacity to save:** If you are a small saver, invest in a scheme which does not require a large amount as the minimum specification to invest.
- **Safety of the investment:** To save, you have to often sacrifice some present requirement. You would therefore, definitely want your saving to be safe. Your investment documents should be kept very safely. Moreover, there

are certain schemes which are not likely to pay you a good return owing to the fluctuating market prices. You must try to avoid such schemes.

- **Higher rate of interest:** The longer you keep your money in an institution, the higher is the rate of interest it offers you. Also different institutions offer different rates of interest for the same period. Institutions which require your money urgently, may offer you a very high rate of interest. You have to be cautions to see that the institution is a reliable one.
- **Easy liquidity:** There may be times when you suddenly need your money. Easy liquidity enables you to get back your invested saving. There are some schemes where you cannot withdraw your money before a stated period. Investing all your saving in such schemes will make it difficult for you to get your money when you need it.
- **Other benefits:** Besides a high rate of interest, there are some other benefits like dividends and income-tax relief which are offered by a few schemes.
- **The purchasing power:** At the end of the investment period, the increased value of the saving should be equal to or more than the inflation during that period.
- **Convenient place of investment:** Most investments require paperwork. If the institution in which you invest is at a convenient place, visits can be made easily.

13.7.3 OTHER FACILITIES OFFERED BY FINANCIAL INSTITUTIONS

Besides savings, various financial instititions offer the following facilities to us.

i) Credit Card
ii) Debit Card
iii) ATM Card
iv) Loan
v) e-banking

Let us learn more about these.

i) Credit Cards

Fig. 13.8 Credit/ Debit card

Most banks provide credit card facility to their customers. This card can be used for purchase of goods and services from selected outlets authorised by the bank. Since this card is made of plastic, it is also known as plastic money. The amount of credit a customer can avail of is limited as agreed upon at the time of issue of the credit card. You can also withdraw money using a credit card through an automated teller machine (ATM). At the

end of every month you receive a statement of the total credit availed by you. You have to repay the whole amount or part of it as mentioned in the statement.

A high rate of interest is charged on the outstanding balance, therefore, you should be careful in using a credit card.

ii) Debit Card

This card is similar to a credit card except in the following terms:

- This card is issued against your savings bank account.
- As you make a payment using this card, the money is automatically debited from your account.
- In this manner you use your money instead of taking credit from the bank.

iii) ATM Card

Using a credit or a debit card, you can withdraw money from an ATM at any time of the day or at night (24 Hours services). These are located in various places like a bank building, shopping complex, a residential area or railway/bus terminals etc. Thus cash is available even beyond the bank hours. Using a credit card at an ATM attracts a high interest rate. In the case of a debit card, you withdraw your own money for which no interest is charged.

iv) Loans

Today financial institutions provide loans for many purposes like personal use, education, purchase of a house, vehicle, household durables, maintenance and repairs of household purchase; setting up your own business, etc. The interest charged by these institutions varies according to the purpose, amount, repayment period and type of institution (government or private). These loans can be returned easily in monthly installments. To avail of these loans you need to provide either a guarantee and/or a bond and/or a security in the form of a fixed deposit, NSCs, property or jewellery etc.

v) e-banking

These days the internet provides you the following services at the press of a button:

- to know your bank balance, amount of credit available, apply for a chequebook or draft, credit card payments, etc.
- to utilise tele marketing facility to purchase goods or to avail services.
- to purchase railway and air tickets, and
- pay your telephone, water and electricity bills.

This saves you time while making trips to the banks and other places.

INTEXT QUESTIONS 13.6

Fill in the cross word puzzle using the hints given below. The number of letters in brackets indicate the number of letters in the word.

Fig. 13.9

Hints

ACROSS:

2 Facility offered by financial institutions (4)

5 A form of plastic money (10)

10 Another word for buying (8)

11 24 hr facility to withdraw money (3)

DOWN

1 Worldwide network of computers (8)

3 Charged when credit card bill is partly paid (8)

4 Use of internet for financial services (9)

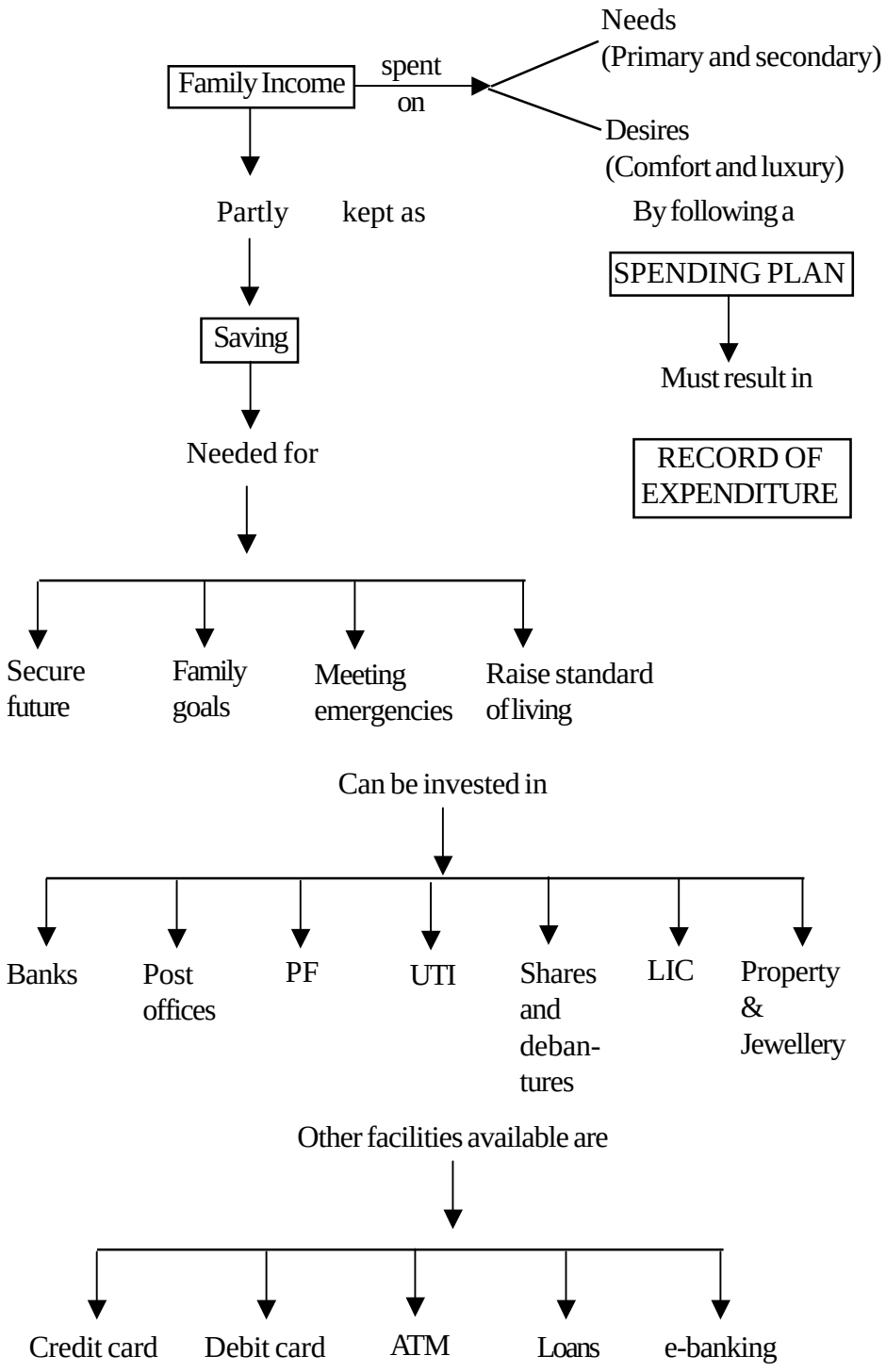
6 Money deducted from bank account when used (9)

7 Bought on loan from a bank (5)

8 Can use credit card to buy this for travelling (6)

9 Safe place to keep your money (4)

WHAT YOU HAVE LEARNT



TERMINAL EXERCISE

1. Re-arrange the letters to denote the correct term for the following:

   (a) Maintaining day to day accounts — DOERRC

   (b) You wish to fulfil these after your needs are met — REDSSIE

   (c) Money spent on acquiring goods and services — TEENTPREXIU

   (d) Money available to fulfil the family needs and desries — EIOMNC

   (e) Money kept aside for future use — GNVSAIS

   (f) Growth of savings by keeping in special schemes — MIVNETTEN

   (g) Easily accessible institution for saving — TOPS EFIFCO

   (h) Security against death or accident — ECASUINRN

   (i) Saving in NSCs gives you this advantage. — XTA NTOMIEEXP

   (j) Monthly deduction from the salary as compulsory saving — NETIROVPD DUFN

   (k) A fixed form of saving — YERROTPP

2. What is investment?

3. What are the ways in which a small saver can invest?

4. What are the factors you would consider before selecting a scheme of investment?

5. If you are the only earning member at home, which scheme would you invest in? Give reasons.

ANSWERS TO INTEXT QUESTIONS

13.1 1. (a) RI (b) NI (c) MI (d) RI
(e) MI (f) RI (g) MI (h) RI
(i) RI

2. (a) Mr. Anand.

   (b) House rent expenses are more than the expenses for lunch and petrol charges. Thus Mr. Anand is saving on rent and on transport expenses, which is more than Mr. Lal's savings.

13.2 1. (a) buying a refrigerator

(b) buying nutritious food

(c) buying a mixer grinder

(d) buying warm clothes

(e) buying their own house

13.3 1. (a) F- all kinds of income must be managed to get maximum benefit.

(b) F- A smaller income also needs management for greater satisfaction.

(c) F- to fulfill all the needs, better management of income is required.

(d) T- A clear statement of your income helps you to manage it better.

(e) F- Complete control over both income and expenditure is called managing income.

2. Rupees 2687 is the balance on the 10th day.

13.4 a) No - storing dangerous items can cause fire/health hazards. It may not be allowed legally.

b) No - you will have to pay salary to servant. You will compromise on the safety of your house.

c) No - full time job is not always available. You may not be qualified to hold a full time job.

d) No - expenditure on entertainment can be curtailed. You can do some work yourself.

Fig. 13.10 Solution to crossword

13.5 (a) daughters' education and marriage and medical expenses, fulfilling post-retirement needs (any two)

(b) education, buying a house and household durables (any two)

(c) buying a house and post-retirement needs.

ANSWERS TO TERMINAL EXERCISE

(a) Records (b) Desires (c) Expenditure, (d) Income
(e) Savings (f) Investment (g) Post Office (h) Insurance
(i) Tax Exemption (j) Provident Fund (k) Property.

2.5 Refer Text.

AUDIO - Instructions on how to fill a moneyorder form.

VIDEO - Banking Dak Ghar Bhachat Yojna

For more information log on to
www.personalbudget planning saving-money.com

14

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ENERGY CONSERVATION

If you were asked, "where does your 'energy' to work come from"? You would probably reply, from the food that you eat. Similarly, the energy used for cooking food comes from burning wood, coal, cowdung cakes, kerosene, gas and electricity. The energy to run your fan or T.V. comes from electricity. In this way, you are all aware of using energy in its different forms. But have you ever stopped to think what the world would be like if there was no light or heat from the sun or if there was no electricity to light up your home? You are also aware the electricity can be in short supply and as a result there are power cuts for short/long durations.

In this lesson, we will try and learn more about the sources of energy and the need to make wise use of all sources of energy available to us. We shall also try and find new and innovative sources of energy to fulfill our daily energy requirements.

OBJECTIVES

After reading this lesson, you will be able to-:

- explain the meaning of the term 'energy';
- classify the various sources of energy as renewable and non renewable;
- discuss the importance of energy conservation;
- suggest methods of conserving energy;
- identify energy options for the future.

14.1 WHAT IS ENERGY?

Energy may be defined as

> The capacity for doing work.

You must have seen that use of energy always brings about some change -a fan moves, a stove burns to give heat, a torch gives light, a solar calculator works when light falls on it or a pump brings up water. You can perhaps quote many more examples. In all cases, some work is being done and the factor which provides the capacity for doing this work is known as 'energy'.

The question now is, *where* does energy *come from?* .

> Sun is the source of most natural energy in this world.

You may disagree and say that you get your energy from, say, fire, electricity, light, etc. You are right, of course. Let us examine this in a little detail.

> The energy that you get from 'fire' comes from burning wood, coal, oil or natural gas. All these substances are known as *'fuels'*. Apart from wood, the other fuels are also known as *'fossil fuels'* because they are obtained from beneath the earth's surface. Over millions of years, the sun's energy transformed dead plant material into coal/oil/natural gas. So we can say that most fuels derive their energy from the sun.

'Electricity' is produced with the help of moving water, steam, coal or oil. You already know that coal and oil derive their energy from the sun. Moving water, too, derives its energy from the sun as it is a part of the water cycle caused by the sun.

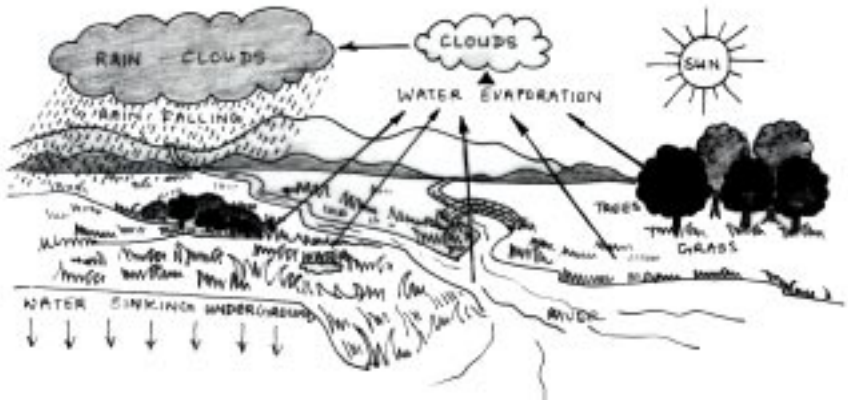


Fig. 14.1: The Water Cycle.

There are some other sources of energy like wind, nuclear fuel, geothermal energy, etc. Have you heard of windmills? When the sun causes a change in the air temperature, a *wind* is caused and we use the energy of this moving wind for various purposes. The energy released during nuclear reactions in nuclear fuels like plutonium and uranium is also used to produce electricity. Geothermal energy

is the solar heat energy which is trapped by rocks deep within the earth. Scientists today have devised a way of utilising this energy for producing electricity and the other forms of energy.

Can you now list the sources of energy?

14.2 SOURCES OF ENERGY

Following are the various souces of energy:

1. Sun
2, Wind (wind mill)
3. Moving water (hydro electric projects)
4. Fuels (Wood/coal/oil/natural gas)
5. Nuclear fuels
6. Electricity
7. Geothermal energy.

INTEXT QUESTIONS 14.1

1. Tick mark the sources of energy from the list given below:

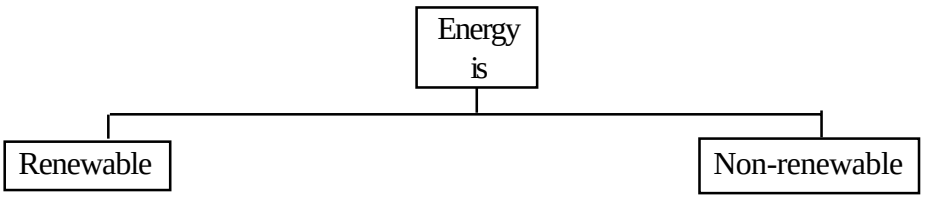
(i)	Petrol	(vi)	Pond water
(ii)	LPG	(vii)	Tap water
(iii)	Turpentine oil	(viii)	River water
(iv)	Kerosene oil	(ix)	Sunlight
(v)	Engine oil	(x)	Charcoal

2. State whether the following statements are true or false and correct the false statements:
   (i) Electricity can be produced with the help of pond water.
   (ii) Wind is caused due to change in air pressure.
   (iii) Geothermal energy was initially solar energy.
   (iv) Wood, coal and oil are natural fuels.
   (v) Electricity can only be produced from water, steam, coal and oil.

14.3 CLASSIFICATION OF SOURCES OF ENERGY

Sources of energy can be of two types – those which are limited and will be exhausted after using for a certain number of years; and the second type which have a nearly endless supply.

Renewable means anything which that can be replaced endlessly, i.e. there is an endless supply. **Non-renewable** means something which can be repelaced up to a limited period after which its supply runs out. On the basis of the above explanation, can you now separate the sources of energy as renewable and non-renewable? We can say:



1. Sun
2. Wind
3. Water
4. Geothermal

1. Fossil fuels
2. Wood
3. Nuclear fuels
4. Electricity

Renewable Sources

You know that there will be an endless supply of solar energy. We will have the energy of moving wind and water so long as the sun is there. Rocks deep inside the earth have trapped the sun's energy but if we use this geothermal energy at a faster rate than it is being trapped, it may also prove to be a non-renewable source of energy. But there is no immediate danger of this happening as estimates predict that energy will last for a long, long time to come.

Non-renewable Sources

Fuels like coal, oil and natural gas have taken millions of years to be formed. But the rate at which coal is being mined and oil drilled for meeting our energy requirements, is much faster than the rate at which they are being formed. Hence, existing supplies are fast running out.

Electricity is produced by burning fuels like coal or oil, by using the energy of flowing water or of steam or by using nuclear fuels. You may argue that since fuels are limited in supply, we can always switch to producing electricity by using flowing water. In that case, electricity would then be a renewable source of energy. But this is not actually so because hydroelectric projects have already been set up at most of the possible sites on major rivers in the country. These power projects are already producing electricity to their maximum capacity and there are no prospects of increasing the supply of electricity to meet increased demand. Hence, electricity, too, becomes a non-renewable source of energy.

Today. *nuclear fuels* are also being used to produce electricity but we have to remember that supply of all nuclear fuels are limited and if they are used unwisely they will soon run out.

INTEXT QUESTIONS 14.2

1. From the list given below, separate the renewable sources of energy from non-renewable sources by marking R and NR respectively.

(i)	Sunlight	(vii)	Wood
(ii)	Petroleum	(viii)	Kerosene
(iii)	Steam	(ix)	Nuclear fuel
(iv)	Charcoal	(x)	Electricity
(v)	Water	(xi)	LPG
(vi)	Diesel	(xii)	Wind

Activity 14.1: Observe the use of various sources of energy in your home and neighbourhood. Classify them as renewable and non-renewable.

14.4 ENERGY CONSERVATION: WHY?

Energy conservation involves use of lesser energy for the same level of activity.

Let us try to understand this with the help of an example. Supposing you want to make *'dal'* for lunch. There are two ways of doing this : you could cook the dal in an ordinary pan with a lid on it or you could use a pressure cooker. Needless to say, the resultant 'dal' would be the same in both cases. By using a pressure cooker, you would save both time and energy used for cooking. Supposing we go a step further and say that you wish to cook not only 'dal' but also rice and potatoes. Again, one way would be to cook the three separately, resulting in the use of stove at least three times, and another way could be to use separators of a pressure cooker and cook all the three together. What is the benefit of using a pressure cooker or of cooking things together? You are 'conserving energy', i.e. you are using less energy to achieve the same results.

The question that now arises is, WHY do we need to conserve energy? After all, all forms of energy are easily available to us at the moment.

We must conserve energy because of a number of reasons. These are explained below:

1. Demand exceeds supply

There is an increasing demand for energy due to increasing population, industrialisation, traffic on roads and automation in home,office and farms.

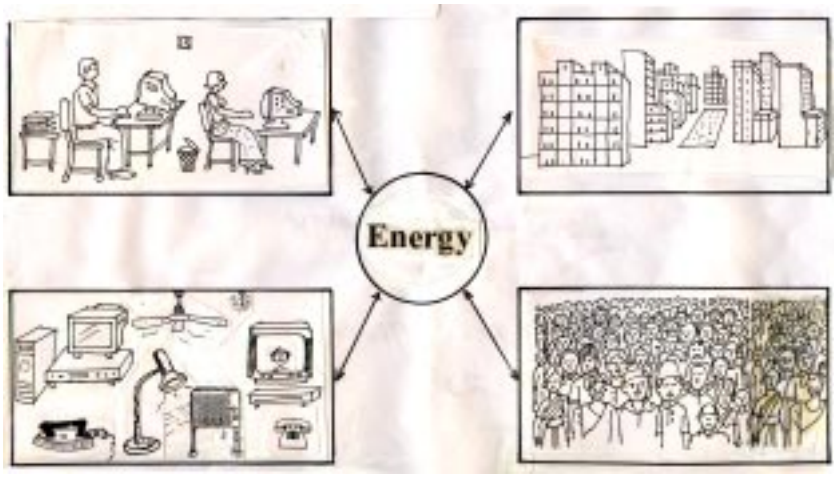


Fig. 14.2: Demands on energy

You yourself must have observed that the ever increasing population is creating an increasing demand for energy. Increasing number of people need more houses to live in and this leads to increased felling of trees to provide timber and furnishing. At the same time, more coal, kerosene and gas are needed to cook the food for more people. More people today need more electricity to light their home, to run their coolers and geysers, to run washing machines, computers, etc., which results in increased use of power leading to power cuts. What steps do you think should be taken to reduce or close this gap between demand and supply of energy? We have two options before us:

(i) increase the supply

(ii) reduce the demand

Since supply of energy is limited, we are left with the second option, i.e. to reduce demand of energy. How can we do this?

By conservation and wise use of energy available.

2. Energy saved is energy generated

You must all be familiar with a bank. Whatever money you manage to save, you put in a bank and after some time you can see your savings grow, if you are careful to take out less money than you put in. If at any point of time, you start using the money faster than you put in it you will soon run out of money and will have to face a shortage.

Now, imagine that there is an energy bank. Whatever energy you save in your daily activities gets accumulated in this energy bank so that you can use it in future. As your 'energy savings' grow, there will be less pressure to produce more energy. Similarly, the energy that you save could be used elsewhere. For example, if you decide to have a daytime wedding in the family, with no decorative lights, the electricity you save could perhaps prevent a couple of power cuts in the city.

Every person's motto today should be:

Save on Something (S.O.S.)

3. Fuels are limited

Fuels are the most common sources of energy and you have already learnt that the deposits of coal, gas and oil are limited. A look at the chart given below will tell you where we stand today in terms of their availability to us in the years to come.

	Fuel	Known supplies (in years)	When likely to run out
1.	Natural Gas	about 30	AD. 2035
2.	Oil	about 50	AD. 2055
3.	Coal	about 280	AD. 2285

After this what?

You can see that oil and natural gas are likely to run out during your own lifetime. The choice is before us! Either we carry on as we are or we must plan the use of fuels so that we conserve them for future use.

INTEXT QUESTIONS 14.3

Q 1. Match column A with column B

	Column A		Column B
(i)	Cooking two dishes together leads to	1.	Renewable
(ii)	Increased industrialization results in	2.	Energy generated
(iii)	Energy saved is	3.	Limited
(iii)	Natural fuels are	4.	Increased demand for energy
		5.	Conservation of energy
		6.	Population explosion

2. List four factors which contribute in creating a gap between the demand and supply of energy today.

(i)

(ii)

(iii)

(iv)

14.5 CONSERVATION OF ENERGY: HOW?

By now you all have realised the fact that we are facing a very real possibility of some of these energy resources drying up during our lifetime.

Conservation of energy has to be the order of the day. Each and everyone of us has to unite and collectively take action to preserve and conserve energy. Each one of us has to think, "Is there anything which I can do?"

Yes, there are many small ways in which we can contribute our share of efforts in energy conservation. Let us see how we can do so.

Energy can primarily be conserved:

1. At home
2. In the farm or work place
3. On the road

1. Energy Conservation at Home

(a) Power

Switch off a little ..... save a lot!

Take a look at your last power bill. It need not have been as much as it is. Just a little care, a little alertness on your part could have brought it down. How?

- Switch off lights and fan while leaving a room.
- Change over to *energy efficient tube lights* from power consuming bulbs.
  - Remember! A 40 watt tubelight gives twice as much light as a 100 watt incandescent bulb. This means a savings of 60% power in addition to more light!
- Replace traditional chokes of tube lights with electronic chokes. They consume one third energy.
- Keep lights and fixtures clean and dirt free.

Dust and dirt reduce lighting levels by as much as 30%.

- Use dimmer switches to adjust the amount of lighting according to your needs.
- Use light colours for walls. This helps reduce lighting requirements by up to 40%.
- Replace old fan regulators with electronic regulators.
- Use a refrigerator of the size your family needs.

Oversized refrigerators mean more power consumed.

  - Avoid opening the fridge door frequently.
  - Defrost your fridge regularly.
- Use your washing machine at proper loads.

- Mix hot water in a bucket for a bath rather than having a geyser shower.
- Switch on the AC an hour later and switch it off an hour earlier.

An AC switched off for an hour can keep a 40 watt tubelight on for 50 hours

- When ironing, ensure that you have collected all the clothes first.
- Use your oven, hair dryer and vacuum cleaner sparingly to save on power.
- Avoid non-ISI appliances - they may be good bargains but being sub-standard and their components inefficient, they consume more electricity.

ISI mark is your guarantee to energy savings.

(b) Fuel

As for power, you can adopt many simple ways in which to cut down on your fuel bills. Those of you who use LPG or gas cylinders for cooking at home are already aware of the way in which gas prices have been shooting up recently. Kerosene prices are not far behind. So what can we do to reduce our fuel bills? Here are some tips.

- Use ISI marked cooking stoves only.
- Replace traditional wood stoves with the 'unnat chullah' (smokeless chullah) developed by the Government. These are 20-25 % more heat efficient.
- Use solar cookers as far as possible.

Solar energy is free and abundantly available.

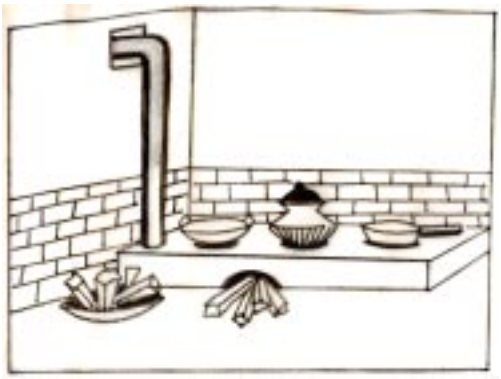


Fig. 14.3 Unnat Chullah

- Avoid cooking in open pans. Use a pressure cooker and save your fuel.
- Use separators of a pressure cooker to cook more than one dish at a time.
- Use copper bottom or sandwich bottom pans which are more heat sensitive.
- Switch on the gas after putting the pan on and switch off before removing the pan.

- Keep the burner holes clean and free of dirt and grease.
- Use small burner for small-sized vessels.
- Switch off the regulator switch of the gas cylinder at night.
- Try and serve the food soon after it in cooked in order to avoid reheating it.

The above are just some tips to avoid excessive power and fuel use at home. These tips will lead to substantial savings on your energy bills without compromising on comfort and convenience in any way.

2. In the farm and workplace

(a) In the farm

Farmers are increasingly using farm machinery like tractors, threshers, water pumps, etc. An effort must be made by farmers too, to conserve energy, which means they must try to get maximum work done with the use of least possible energy. Let us see how.

- Maintain tractors well. Poor maintenance leads to 25% loss of diesel.
- Prevent leakage of diesel.

Loss of one drop per second results in a loss of 2000 litres of diesel per year!

- Switch off the engine when the tractor is not in use.
- Drive in appropriate gear.

Use of wrong gear increases diesel consumption by 30% and decreases work efficiency by 50%.

- Keep the air filter clean to reduce wear and tear of the engine.
- Replace old tyres.
- Plan the use of tractor on the field. Digging in lengthwise direction rather than widthwise, saves diesel in the field.

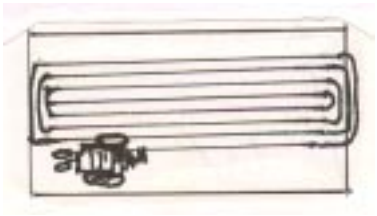


Fig. 14.4 Planned digging

(b) At the work place

The feeling people generally have is - "Who cares about energy conservation at the office. After all, I'm not paying for it !" But this is where we go wrong. Ultimately it is we who pay for all the energy that is wasted in the office - in the form of energy shortages, higher price to be paid for energy, more taxes and so on. So,

it becomes imperative that we not only adopt some energy saving measures at our work place but also encourage our fellow workers to do the same. Here are some suggestions for you:

- Ask the cleaning staff not to switch on all lights and fans before people come to the office.
- Switch off fans and lights when you leave the room.
- Minimise the use of air-conditioners.
- Switch off computers when not in use.
- Avoid unnecessary photocopying of documents.
- Encourage people to use the stairs instead of the lift, specially in places like hospitals.

3. On the road

Many more people own vehicles today than they did ten years ago. Vehicles are used to go to the office as well as for family outings. This has resulted in a tremendous increase in the use of petrol, diesel and compressed natural gas (CNG). What do you suggest to control the use of petrol, diesel and CNG? We could consider the following:

- Use a car pool instead of individual cars to travel to work

Fig. 14.5 : Car pool: An economical way of travelling

- Adopt petrol saving measures such as
  - * Drive at a slow and constant speed
  - * Minimise the use of brake and clutch
  - * Maintain proper air pressure in the tyres
  - * Prevent leakage of fuel at all costs
  - * Keep the engine well tuned.
- Encourage installation of light sensitive switches and solar panels for street lights.

- Discourage the use of neon lights for advertising. These can easily be replaced by using solar panels which convert solar energy to electrical energy which lights up neon signs at night.

INTEXT QUESTIONS 14.4

1. Fill in the blanks:
   (i) _____are more energy-efficient than bulbs.
   (ii) _____chokes consume one third energy as compared to traditional chokes.
   (iii) _____ coloured walls help in reducing the lighting requirement of a room.
   (iv) More power is consumed by _____ refrigerators.
   (v) Energy saving is guaranteed by using products bearing the _____mark.
2. State whether the following statements are true or false and correct the false statements:
   (i) Wood stoves are very heat efficient.
   (i) Cookers which work on solar energy save a lot of fuel.
   (ii) Sandwich bottom pans take a long time to heat.
   (iii) Small burners are suitable for small vessels.
   (iv) Food should be eaten as soon as it is cooked to avoid reheating.
   (v) Driving in the correct gear increases work efficiency by 50%.
   (vi) Wear and tear of engines depends upon the state of the air filter.
   (vii) Computers should not be switched off during the day.
   (viii) Wastage of energy in the office does not affect you personally.
   (ix) Street lights need light sensitive switches.

14.6 WHAT IS THE ALTERNATIVE?

We all agree that our prime concern today should be to utilise energy in such a manner that it can be made to last for as long as possible. You can see from the chart given earlier that natural gas and oil will soon run out. We may be able to stretch their use by adopting stringent conservation methods. But what happens after that? We would be back at square one, unless we can think of some alternatives.

Is there an alternative? Yes, there certainly is! You have already studied that energy is renewable and non-renewable. If we want to stretch our non-renewable sources of energy we have to supplement them with the renewable sources.

Do you remember which are the renewable sources of energy? Since the use of these sources is not widely prevalent today, we also refer to them as non-conventional sources of energy. The non-renewable sources of energy are also known as the conventional sources of energy.

14.7 ENERGY OPTIONS FOR THE FUTURE

1. Biogas

Biogas is a product of fermentation of animal manure in the absence of air. It chiefly consists of methane gas which can safely be used as a fuel for cooking, as well as lighting.

Fig. 14.6 Biogas : The cheap and healthy fuel.

Ordinarily, a small biogas plant fed by the manure of 2-3 animals can produce enough gas for the daily cooking and lighting needs of a family of four persons. In addition, biogas can be used to pump water or run small motors of less horse-power.

Some other advantages are:

- The sludge or digested waste is an excellent fertilizer and increases the yield of crops and vegetables.
- It keeps the environment around the house clean since all animal manure is fed into the biogas plant.
- It prevents eye and lung diseases caused due to smoke from firewood.
- It conserves forests because wood is no longer used as fuel.
- It generates employment to masons and labourers needed to set up more biogas plants.

2. Solar Energy

Solar energy is available free of cost and is absolutely non-polluting. It has been

available to mankind for centuries but it is only recently that technological advancements have been made to trap and effectively utilise this energy. Some of the ways in which solar energy is being used today are:

(a) Solar cooker - This is a shallow, square box with black sides and bottom and a glass top. When the black bottom is hit by sunlight passing through the glass top, it gets heated up. When food is kept inside the box, it gets cooked by this heat.

Fig. 14.7: Solar cooker

Some advantages of using a solar cooker are:

- Fuel cost is reduced. Regular use preserves an average of 2 kg of combustible wood per day!
- It is totally safe to use - there is no fire, no leaking gas and no electric shocks
- It does not require constant attention.
- It can cook up to four dishes at a time.
- It is very easy to use.

Use a solar cooker to cook your family's meal!

b) Solar lighting - Ordinary daylight is transformed to electrical energy with the help of solar cells. These solar cells produce electricity according to the amount of sunlight falling on them. When chemical storage batteries are used along with these cells, the excess energy produced on sunny days is stored for use on cloudy days.

Fig. 14.8 Solar panels

Solar cells are used to produce lighting in

(i) Streets

(ii) Homes

(iii) Neon sign for advertising

(c) Solar heating - Heat energy from the sun is being used in various ways today. It is used to:

- Heat water for bathing purposes in home, hotels and hostels
- Provide central heating in homes, hotels and hostels
- Make salted water fit for drinking purpose
- Dry timber, crops and fish in solar furnaces
- Provide refrigeration in small, specially designed refrigerators. These are specially useful in keeping life-saving drugs at a low temperature and in preserving perishable agricultural produce like fruits and vegetables and milk and its products.

INTEXT QUESTIONS 14.5

1. List at least four advantages of using non-conventional sources of energy.
2. Name the chief constituent of biogas.
3. List two uses of biogas.
4. Name the device used to transform daylight to electrical energy.

---

3. Hydel Energy

'Hydel' refers to water. Surely, all of you must have heard of big hydroelectric projects in our country like Bhakra-Nangal Project or the Damodar Valley Corporation (DVC), etc. These are enormous projects set up at the cost of crores of rupees and they generate lots of electricity. With the growing demand for electricity, the need to set up more such projects is being felt. But since most of the major sites on the big rivers have already been used for the purpose, there is very little scope of setting up more big projects. Then, what is the alternative? We have to now devise and set up microhydel projects.

It is realised that a small quantity of water falling from a great height can produce as much power as a large quantity of water falling from a much shorter height. Thus, the smaller rivers can be used to set up microhydel projects. The advantages of installing such micro projects are:

- They do not require heavy investment on installation.
- They are comparatively easy to maintain.
- They can be set up to supply electricity locally to geographically far flung areas which are not covered by the national grid system.
- Local supply of electricity reduces cost of distribution.

- Decentralization of power production and supply eases pressure on the larger power projects.

4. Wind Energy

Man has been using wind energy since a long time now - to sail boats on water, to grind grain by setting up wind mills, etc. Now, growing technological advancement has made it possible to generate electricity by using wind power. Let us see how this is done. A very simple structure consisting of blades or propellers and a direction controller is mounted on a high tower. The wind machine is fixed in an open area. When the wind blows, the propellers rotate and generate electricity in the generator to which they are connected.

The amount of energy generated depends upon the wind speed. A two fold increase in wind speed results in an eight fold increase in energy produced. It is estimated that an average wind speed of 20km/hr is essential for economical electricity production whereas a windspeed of 10km/hr is sufficient to work windpumps.

Some of the advantages of using wind energy are:

- it is absolutely free and non-polluting
- it can be used to generate and supply electricity in geographically isolated or hilly areas
- wind machines are cheap to set up and maintain.

Be Non-conventional!

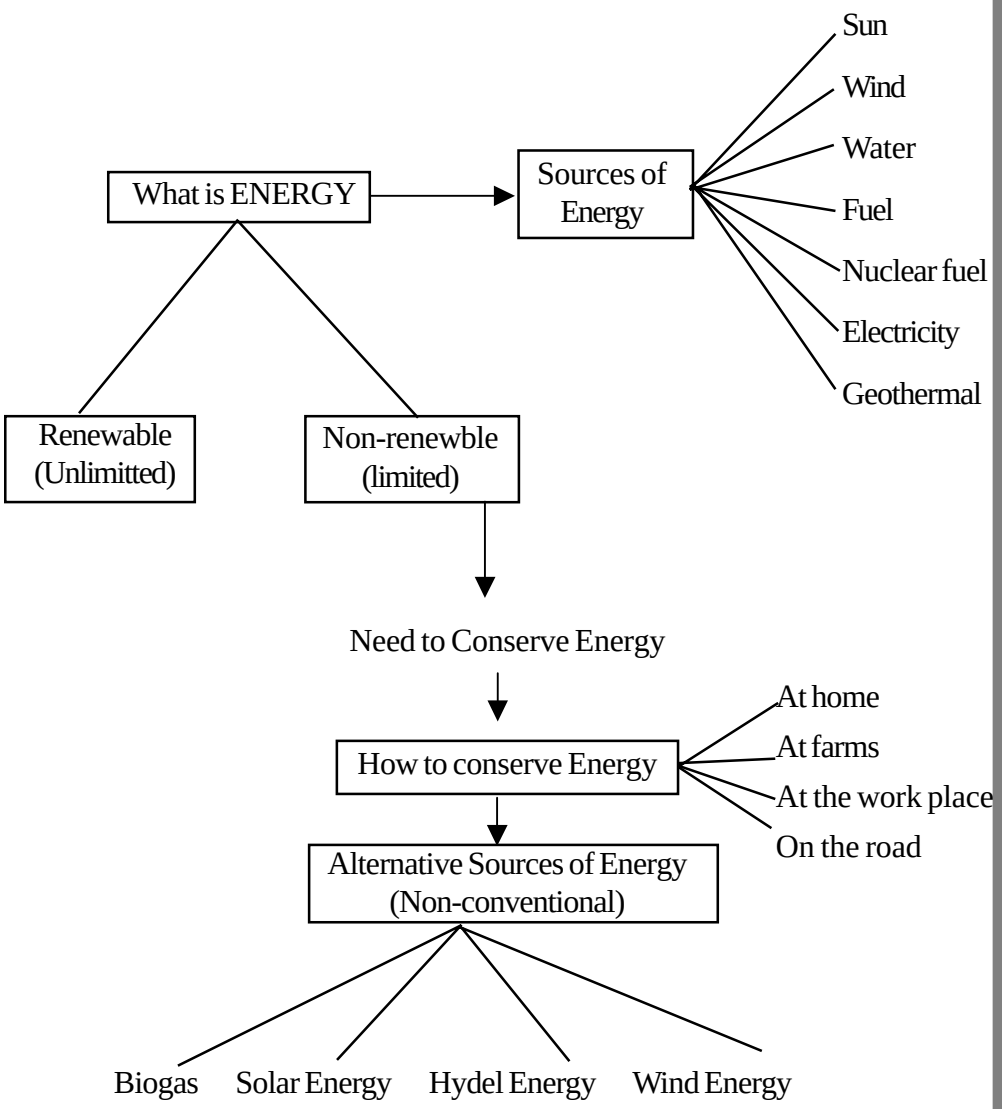
What are the advantages of using the non-conventional sources of energy?

1. There is a never-ending supply.
2. These are easily available.
3. Production and use of non-conventional energy is always pollution free and leaves the environment clean.
4. These are locally produced. Hence there is low cost of distribution.
5. Energy production units can be started on a small scale. Hence, heavy investment is not required.
6. Job opportunities for the local people are opened up.

INTEXT QUESTIONS 14.6

1. What is the difference between a big hydro-electric project and micro hydel project?
2. List five benefits of setting up a micro hydel project.
3. State the advantages of using non-conventional sources of energy.

WHAT YOU HAVE LEARNT



TERMINAL EXCERCISES

1. Explain with examples what you understand by the term 'energy'.
2. Give two examples each of renewable and non-renewable sources of energy in your locality.
3. List five suggestions you would give a housewife to conserve energy in her home.

ANSWERS TO INTEXT QUESTIONS

14.1 1. (i), (ii), (iv), (viii), (ix), (x)

2. (i) False. River water is needed.

(ii) False. Winds are caused due to change in air temperature.

(iii) True

(iv) True

(v) False. Nuclear fuels and hydrothermal energy can also be used.

14.2 R - (i), (xii), (v)

NR - (ii), (iii), (iv), (vi), (vii), (ix), (x), (xi), (viii)

14.3 1. (i)-5, (ii)-4, (iii)-2, (iv)-3

2. Refer to text.

14.4 1. (i) Tube lights (ii) Electronic (iii) Light (iv) Oversized (v) ISI

2. (i) False. Wood stoves are not heat efficient. (ii) True

(iii) False. They heat up very fast. (iv) True (v) True

(vi) True (vii) True should be switched off when not in use

(viii) False. It does affect you personally. (ix) True.

14.5 1. Refer to the text.

2. Methane

3. Cooking, lighting, pumping water, running motors

4. Solar cells

14.6 1. Refer to the text.

2. Refer to the text.

3. Refer to text.

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15

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ENVIRONMENT MANAGEMENT

The day is not far off when a drop of water is going to cost us as much if not more than a drop of oil! And soon, we will have no more forests left to clear! Worse still, whatever little land will be left for agriculture, will have no capacity to grow anything! Alarming! Isn't it?

Our environment is going from bad to worse and will soon loose its ability to support life! Are you wondering why?

To understand the nature and magnitude of these environmental problems and to find remedies for them, we will study environment management in this lesson.

OBJECTIVES

After studying this lesson you will be able to:

- define the term 'environment' and 'environmental degradation';
- identify the causes and adverse effects of environmental degradation;
- explain the term 'eco friendly';
- list eco friendly and non-eco friendly products and practices, and
- define the role of individuals and the government in contributing to a better environment.

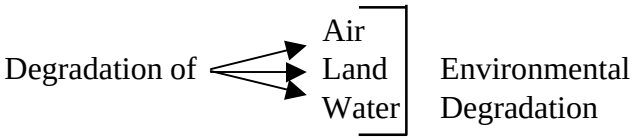
15.1 ENVIRONMENTAL DEGRADATION

What do we mean by environment?

Environment is our surroundings which include all forms of life (plants, animals, human beings), air, water, land, buildings, parks, vehicles, etc.

Our environmental is in a dynamic state. It keeps changing every now and then. You would have observed many changes around you, like floods or drought in certain years, new industries, multi-storey buildings, new means of transport, etc. If these changes are favourable to life, then the environment is not harmed. However, unfavourable changes lead to degradation of the environment.

Environmental degradation refers to an unfavourable change of our surroundings.



For example, if we keep throwing garbage in a park, after some time there will be a large heap of garbage and the place will start smelling. Moreover, it will also become a breeding ground for pests like rats, flies, mosquitoes, etc. Such an **undesirable change** is referred to as degradation**.**

You can observe such environmental degradation not only on **land** but also in **water** and **air**.

15.2 WHO CAUSES ENVIRONMENTAL DEGRADATION?

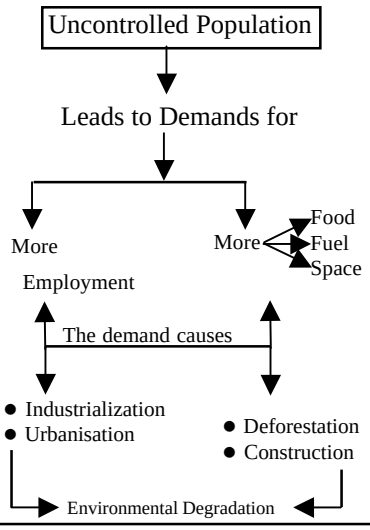
You must be aware that most of the environmental degradation has been caused by man! Take a paper and pencil and list some of the causes you can think of. Did your list include the following?

- Uncontrolled population growth
- Technical advancement
- Poor agricultural practices
- Improper personal habits
- Natural causes

Let us learn more about these causes.

15.2.1 Uncontrolled Population Growth

You are aware that our country's population is increasing every day. This leads to excessive demands on our enviornment in terms of food, fuels and space. More people means more demand for employment. As a result more industries, dams, roads and railway tracks are being constructed. This has led to industrialization and urbanisation, growth of slums, reduced forest cover and unhygenic living conditions. All these are affecting our enviornment leading to its degradation.

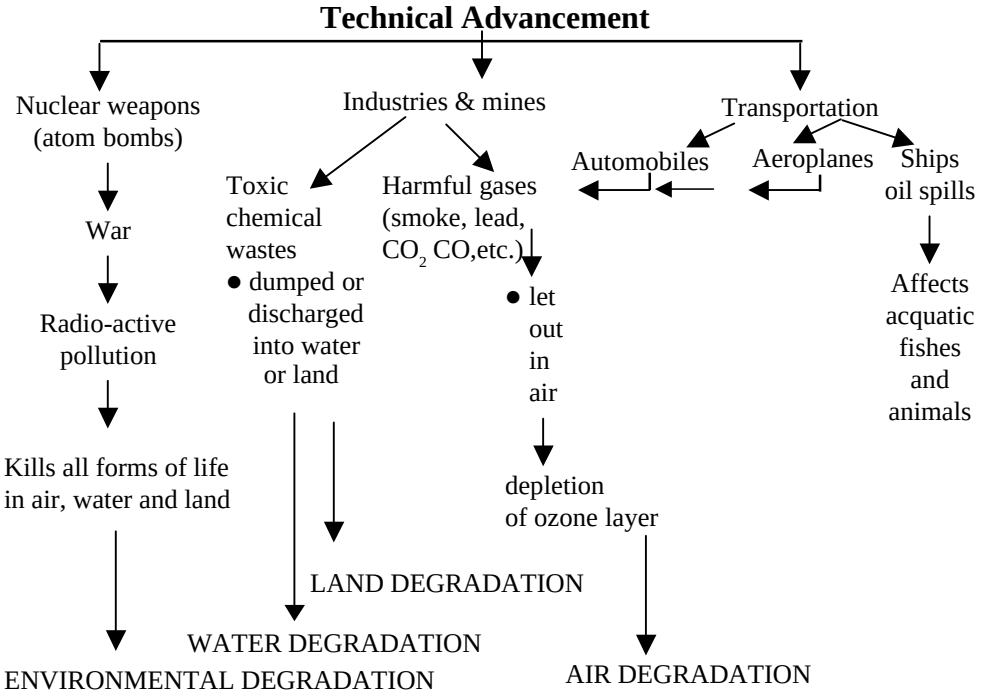


You can play a role in controlling the population and its consequent ill effects by delaying the birth of your first child by a couple of years deciding not to get married before the legal age (18 yrs – girls, 21 yrs – boys).

15.2.2 Technical Advancement

Today there is technical advancement in all walks of life. New models of cars, telephones including cellphones, and home appliances like washing machines, microwave ovens, etc. are flooding the market.

Our offices are also full of new gadgets. They are produced in industries which generate toxic chemical wastes, harmful gases and radio active pollutants during their manufacturing process. These pollutants kill all forms of life in air, water and land. The smoke generated by the industries, mines, automobiles and aeroplanes leads to the depletion of the ozone layer. Thus, our environment gets degraded by these technical advancements.



Notes

Slums: Areas which have jhuggies (temporary houses mostly inhabited by squatters). These areas lack basic facilities such as water, electricity, drainage and sewage disposal.

Squatter is a person who occupies unused land, without having a legal right to do so.

Ozone layer

is a thin protective layer of air around the Earth which protects us from overexposure to ultra violet rays of sun.

CO_2 - Carbon dioxide

CO Carbon monoxide

INTEXT QUESTIONS 15.1

1. Select (√) the right answer.

   (i) Environment consists of

   (a) air that living things breathe

   (b) water, land and living things

   (c) all living and non-living things

   (d) water, land and non-living things

   (ii) Environmental degradation refers to unfavourable change of

   (a) human interactions

   (b) water pollution

   (c) land degradation

   (d) surroundings

2. Match the following items in Column A with the corresponding items in column B

Column A	Column B
(a) Over crowdedness	(i) fuels
(b) Automobiles	(ii) vehicles
(c) Radio-active pollution	(iii) chemical wastes
(d) Aeroplanes	(iv) slum conditions
(e) Industries	(v) air
(f) Construction	(vi) smoke
	(vii) nuclear weapons
	(viii) deforestation

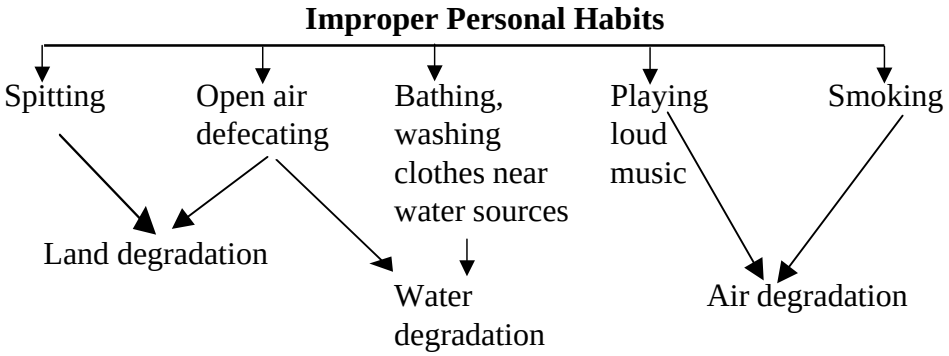
15.2.3 Poor Agricultural Practices

Our agricultural practices have also undergone change. Practices like over-grazing, exessive use of chemical fertilizers and pesticides, shifting cultivation, overploughing and overcropping have led to the hardening of soil and soil erosion. The soil has started losing its fertility and productivity. Thus, soil degradation has become an environmental concern.

15.2.4 Improper Personal Habits

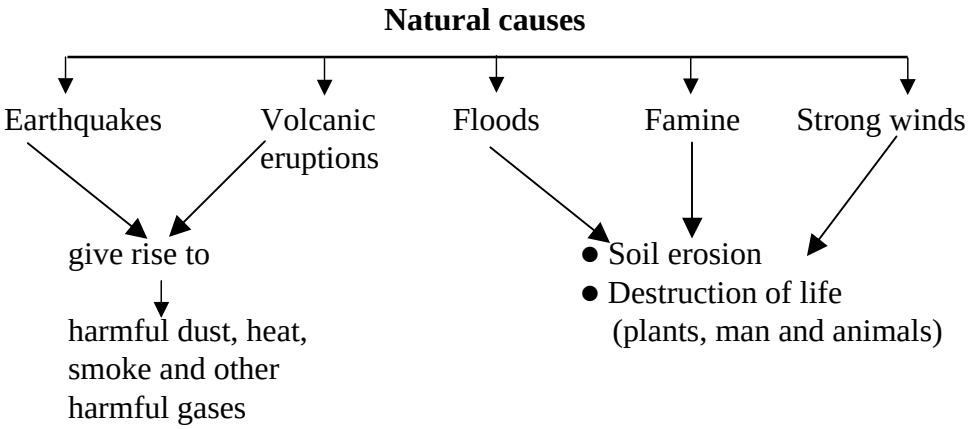
Some of our unhygenic personal habits like spitting in public, defecating in the open, bathing and washing clothes near water sources, etc, has lead to the degradation of land and water. Other habits like smoking and playing

loud music have led to air degradation. All these together, contribute to environmental degradation.



15.2.5 Natural Causes

Sometimes nature also leads to environmental degradation. Earthquakes and volcanic eruptions give rise to harmful dust, heat, smoke and other harmful gases. Floods, famines and strong winds lead to soil erosion and destruction of life among human beings, animals and plants. In this manner land, air and water are all affected negatively leading to environmental degradation.



INTEXT QUESTIONS 15.2

a) Fill in the blanks:

(i) Poor agricultural practices lead to soil _____ and decreases the soil _____.

(ii) Earthquakes and volcanoes give rise to harmful _____, smoke, _____ and _____.

(iii) Overgrazing by cattle leads to _____ of soil and ultimately to _____ erosion.

Notes

(iv) Poor personal habits like _____ and _____ can result in land degradation whereas habits like _____ lead to air degradation.

(v) Floods, famine and strong winds are called _____ disasters.

15.3 EFFECTS OF ENVIRONMENTAL DEGRADATION

So far, you have seen how environmental degradation is caused in different spheres like land, air and water. Obviously, it is bound to affect us in some way or the other.

Let us see the different forms of environmental degradation and how they affect us:

- Soil / land degradation
- Deforestation (clearing of forests)
- Degradation of air
- Degradation of water
- Slum conditions

15.3.1 Soil / land degradations

Do you know that soil is the top fertile layer of land in which plants grow? Have you ever wondered what happens to so many leaves that fall on the ground every autumn? Yes, they disappear into the ground after some time. But do you know why?

Actually, soil contains some very important micro-organisms which help in decaying waste materials like dead plants and animals into simpler substances. In this process, they release nutrients, which help to increase the fertility of the soil. As they make the soil fertile these micro-organisms are also called the farmer's friend.

But when we use too much of chemical fertilizers, pesticides or dump wastes from mines and industries on land, these micro-organisms get killed. Thus, eventually the fertility of soil is affected, as the micro-organsims are not available to decompose the dead plants and animals.

Do you know that sprays like pesticides also penetrate plants, fruits and vegetables and is passed on to men and animals when consumed. It causes deadly diseases like cancer and also affects the nervous system. Traces of pesticides can also be detected in milk.

Do you remember what is soil erosion? (Refer to Section 15.2.3)

'The top layer of soil which is fertile is bound by roots of the trees. But with clearing of forests, this soil gets exposed and gets carried away by strong winds, floods, glaciers, etc. This is called soil erosion and it affects the fertility of soil.

Over cropping:

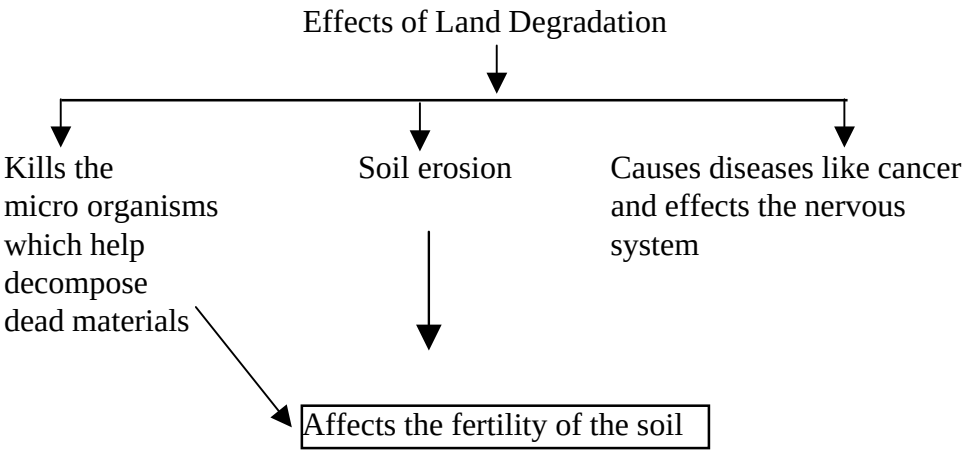
When too many crops are raised at the same time or with very little time gap.

Soil erosion:

When the top fertile layer of soil gets carried away by wind, water etc., it is called soil erosion.

Activity15.1: Take two boxes and fill them up with soil. Tilt them at an angle. Sow grass in one and leave the other one bare. Water them and collect the water which runs off the bottom of slopes. Note the colour of the water. Calculate the amount of soil (when water dries up). You will notice that the amount of soil lost is more in the case of the barren box as compared to the one with grass. This experiment shows that plants help to bind the soil and prevent soil erosion.

In short,


Effects of Land Degradation
Kills the micro organisms which help decompose dead materials
Soil erosion
Causes diseases like cancer and effects the nervous system
Affects the fertility of the soil

15.3.2 Deforestation

Forests are referred to as 'oxygen banks'.

Forests are very important to us as they provide us wood, medicinal plants and many raw materials for commercial and domestic use. Most important, they supply oxygen to us and influence the weather conditions. They cause rainfall, maintain temperature and control wind and humidity.

You already know that plants check soil erosion. In addition, forest are also responsible for recharging our natural sources of water like springs, lakes and rivers. Last but not the least, they provide home for wild animals and birds.

What happens when there are no roots of trees to bind the top soil?

Yes, it leads to

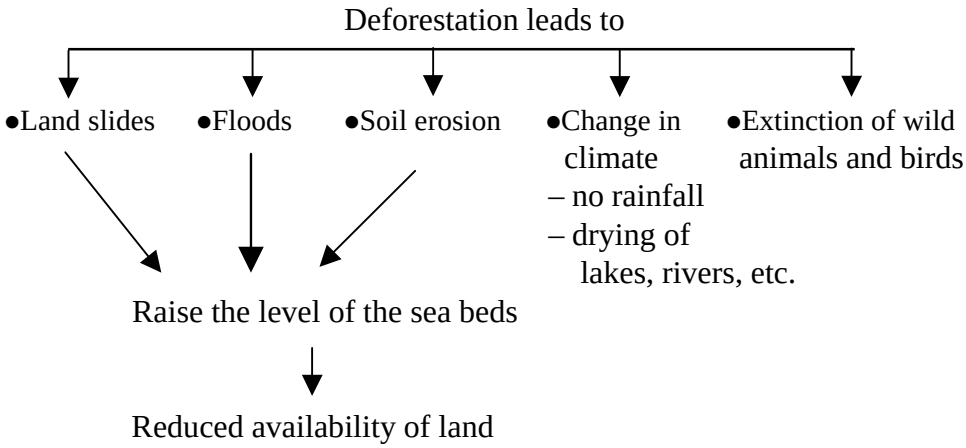
- land slides
- floods
- soil erosion

All this leads to raising the level of the sea beds, and the land available to us is reduced.

Where there are no forests, there is no rainfall, which affects the climate and ultimately leads to drying of springs, lakes and rivers. You must have seen or heard elders talking about springs which existed once upon a time. Now

all you can see is either land or marks of water on the stones. Wild animals and birds are the worst affected as they die and may become extinct. Can you see any difference in the flow of water in a local river in last 2-3 years?

In short,



15.3.3 Degradation of Air

You can see the effects of air degradation in the following ways:

- Acid rain
- Depletion of ozone layer
- Global warming
- Man-made disasters
- Diseases

- **Acid Rain**

  Smoke from vehicles and industries gives rise to harmful gases like sulphur dioxide and oxides of nitrogen. They react with water vapour in the clouds to form dilute acids and come down as **acid rain.**

  This acid rain is very dangerous and affects all kinds of plants, fishes and animals. It even affects the buildings and monuments. Erosion and discolouration of the white marble used in the construction of the Taj Mahal is one such example.

- **Depletion of Ozone Layer**

  Do you remember what is ozone layer? Refer to section 15.2.2

  Yes, ozone layer protects the earth from overexposure to the harmful ultraviolet rays of the sun. This ozone layer gets destroyed by harmful gases used in refrigerators and fire extinguishers. Overexposure to ul-

traviolet rays can cause skin cancer and eye problems like cataract and blindness. It also results in stunted growth of plants.

- **Global Warming**

There are naturally occuring gases in the atmosphere which can absorb radiations of the sun. These are called **"green house gases"**. Because of their presence, not all solar radiations reaching the earth are reflected back to outer space but some of the radiations are held back by these green house gases. This process is called the green-house effect. This effect makes the temperature on earth warm enough for life to flourish.

But because of human activities like deforestation, forest fires, burning of fuels, etc., tons of gases like CO_2, methane, etc., are released in the atmosphere. The gases absorb the solar radiations and form a blanket around the earth, preventing the radiations from reflecting back into space.

This results in an increase in atmospheric temperature which is felt all over the world and is known as **'global warming'**.

You must have noticed that in past eight-ten years, summers are getting hotter whereas winters are getting less cold. Even the rainfall is unpredictable. Every year there is an increase in the earth's temperature! These are the results of global warming!

- **Man-Made Disasters**

Time and again, man has caused massive environmental degradation - killing all kinds of life through leakages and disasters like war and atom bombs. For example, the world still mourns over deaths of lakhs of people who were killed when a nuclear bomb was dropped on Hiroshima and Nagasaki during the World War II. Its effects were seen in handicapped children born several years later to mothers exposed to the radiations. It also affected the plants, animals, aquatic life and the soil for many years.

Years later, another man made disaster was caused when oil fields were burnt during the Gulf War between Kuwait and Iraq. The oil leaked into the sea. The fire spread even to the sea and continued for months. It killed an infinite number of aquatic fishes and animals and the smoke polluted the air for months.

Industrial leakage has also been responsible for many deaths. We, the people of India, can not forget the Bhopal gas tragedy. In Bhopal, a gas leakage from a pesticide factory killed thousands of people. Those who survived are still suffering from respiratory problems like bronchitis, asthma, as well as eye and skin problems.

In yet another incident, thousands of people from Chernobyl town in Russia had to be evacuated because of radioactive leakage. These radioactive particles get carried away by wind to far off places. Finally they settle down and cause soil, plant and water degradation. From here they enter man and animals through the food chain. Thus radioactive pollution affects all kinds of life.

Food Chain
A sequence of organisms which is food for the next higher organism e.g. grass is eaten by deer which is eaten by tiger.

- **Diseases**

  All the above factors are responsible for most of our respiratory diseases like cough and colds, bronchitis, asthma, lung cancer and also irritations like itching of the skin and watering of the eyes. People from heavily populated and polluted cities like Delhi and Kolkata are more prone to these diseases. As we take a step forward and begin to take precautions against the disease caused by depradation of environment it is also important that we take precautions against transmission of HIV, AIDS and STDs. This can be easily accomplished by practising safe sex and insisted use of condoms.

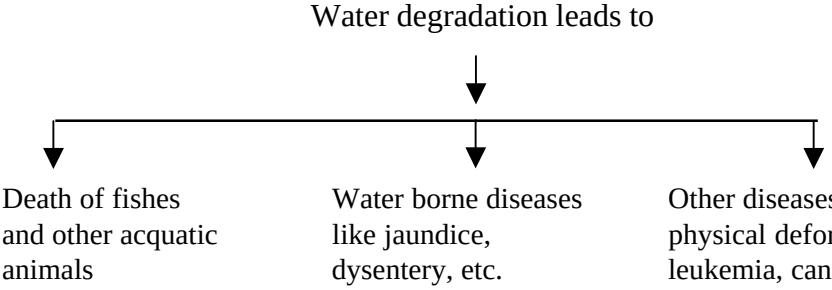
15.3.4 Water Degradation

Have you observed that the water in rivers, lakes and canals is not crystal clear? Most of the rivers, especially those near the towns and cities give out a foul smell. You can even see foam and froth floating on the surface of water. Foam cuts out the oxygen supply to fishes and animals living in the water and they eventually die. Waste from sewage is mainly responsible for most of the diseases like jaundice, diarrhoea and dysentery, typhoid, gastroenteritis and malaria.

Water plants take in CO_2 (expired by water animals) in presence of sunlight and release O_2 (dissolved) which is taken in by animals but foam and froth do not let sunlight pass through them. Thus it cuts out the O_2 supply.

In addition to these, water is further degraded by chemical wastes of industries causing serious diseases like leukemia, cancer, allergies, crippling, etc.

In short,


Water degradation leads to
Death of fishes and other acquatic animals
Water borne diseases like jaundice, dysentery, etc.
Other diseases like physical deformities, leukemia, cancer, etc.

15.3.5 Slum Conditions

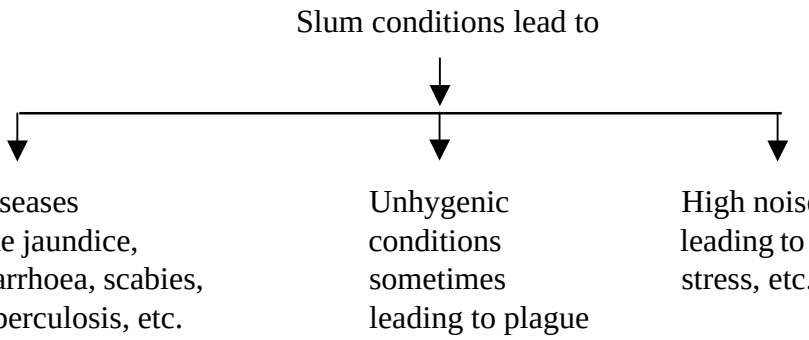
People from rural areas migrate to cities and towns in thousands in search of employment. But where do they live? Yes, they make temporary mud or tin huts with roofs of plastic sheets. Many people live inside these huts with few or no facilities of water, electricity, sanitation, etc.

A cluster of such huts together is called a slum. Have you ever seen such slums? Can you specify their locations? Yes, mostly they are located near rivers and factories, under bridges or along the roads.

If you go into any of these slums, the first thing you notice is overcrowding of people, children in torn, dirty clothes or some without a decent covering, smelly dirty lanes, open choked drains, piles of foul smelling garbage, flies, mosquitoes, etc. Worst of all, all around these slums, within half a kilometre, there are signs of open air defecation. If they are near a river, they treat the river as an open bathroom where they can perform activities like bathing, washing clothes, defecating, etc.

Do you remember plague, the recent Surat epidemic which scared all the people of the country and took so many lives? Improper garbage disposal was the reason. Household pests and rodents like rats thrive in such places. People living in such unhygienic conditions without the basic facilities usually suffer from jaundice, parasite worms, diarrhoea, dysentery, scabies, tuberculosis, malaria and high noise level. Loud noise can lead to permanent deafness, increase in blood pressure, stress, anxiety and nervous breakdown.

In short,


Slum conditions lead to
Diseases like jaundice, diarrhoea, scabies, tuberculosis, etc.
Unhygenic conditions sometimes leading to plague
High noise level leading to deafness, stress, etc.

Activity 15.2: Visit a slum / industrial unit and observe and record their environmental conditions.

INTEXT QUESTIONS 15.3

1. Complete the sentences of column A with the help of column B

Column A	Column B
(a) Trees	(i) global warming.
(b) Chemical fertilizers	(ii) change in temperatures.
(c) Deforestation	(iii) deplete soil fertility.
(d) Refrigeration gases	(iv) lead to land slides and floods.
	(v) prevent soil erosion.

2. Choose the right answer and fill in the blanks:

   (a) _____ (ozone layer / acid rain / heat of sun) is responsible for destruction of life and erosion of buildings.

   (b) Depletion of ozone layer can lead to _____ (skin cancer / anaemia/respiratory disease) and problems of _____ (bones/liver/eyes)

   (c) Global warming has resulted in increase in _____ (winds/ temperature / rain fall)

   (d) Degradation of air is mainly responsible for diseases of _____ (respiratory, circulatory, digestive) system like _____ and _____ (jaundice / asthma / cholera / bronchitis)

   (e) Effect of nuclear explosions can be seen in _____(normal weight / handicapped/happy) children born to mothers exposed to radiations after many years.

   (f) Two diseases which occur due to improper sewage disposal in the water are _____ and _____.
   (jaundice, tuberclosis, malaria, typhoid)

   (g) Two diseases which occur due to chemical wastes of industries are _____ and _____.

   (leukemia,allergy, malaria, asthma)

15.4 A RAY OF HOPE

Still, all is not lost. If we want, we can still save our earth! But the only way is that we must try to adopt products and practices which do not degrade the environment. We address such products and practices as ***'eco friendly'***. Another term used for eco-friendly is bio-friendly.

The word 'eco' is derived from the word 'ecology' which is concerned with

the relationship between plants, animals, man and environment. By eco-friendly products and practices, we mean those products and practices which are not harmful to the environmental.

These products and practices are considered eco-friendly on the basis of their

- production,
- use, and
- disposal

Production: If the manufacturer follows all the safety and preventive measures during production and takes care of waste products, like treating the sewage and industrial wastes before letting them in the water or air then such products are called 'eco-friendly'.

Use: If the product does not harm the environment by giving out poisonous gases or wastes while using, it is eco-friendly. For example, lead in petrol is very harmful but if it is removed from petrol, the petrol becomes 'eco-friendly'.

Disposal: The packaging and leftovers of a product should be such that they are either biodegradable or can be recyled. For example, polythenes cannot decompose and thus become a nuisance as they choke the drains. They are non-biodegradable. On the other hand, paper bags can decompose or even be recyled to make other products like cardboard boxes, newspaper, etc. So, paper bags are considered eco-friendly. Products which do not take care of the environmental and increase its degradation are called non eco-friendly products.

Let us list some non eco-friendly and eco-friendly products.

	Non eco-friendly products	Eco-friendly products
(a)	petrol	(a) unleaded petrol
(b)	crude motor oil	(b) double refined motor oil
(c)	synthetic paints	(c) water based paints
(d)	synthetic fabrics like nylon, acrylic etc.	(d) jute and cotton
(e)	polythene bags	(e) paper bags
(f)	traditional chullahs	(f) smokeless chullahs, solar cooker and biogas
(g)	thermocol glasses	(g) earthen cups (Indian Railways has introduced these cups for serving tea)

Ministry of Environment and Forests has launched an 'Eco Mark' since February 1991. It contains an ISI mark along with an earthen pot which symbolises

Biodegradable:

Which can decompose or disintergrate into simpler substances and be a part of the soil.

Recycled:

Which can be reused to make a new product, e.g. paper can be reused to make board boxes or inferior quality paper.

biodegradability and closeness to the environment. This mark is given by Bureau of Indian Standards (BIS). Eco mark is given to certify that a product fulfills a minimum pollution control standard and achieves high environment friendliness in production, packaging and waste disposal.

Fig. 15.2: Eco mark

Eco-friendly practices can also be adopted instead of non eco-friendly practices. Some of them are listed below:

Non eco-friendly practices	Eco-friendly practices
1. Throwing household garbage on streets or down the hill (in case of hills)	(1) Household wastes can be used to make manure for kitchen garden. Such manure helps to increase soil productivity, e.g. a compost pit in your garden. Do you know that the inmates of Tihar Jail have started converting their garbage into rich manure? They have not only got rid of the source of diseases, but are also selling this manure and earning.
2. Dumping domestic wastes on streets	Planned recycling can be made profitable. For example domestic waste can be recycled-paper and textiles for paper making; metals and glass for remelting for further use, plastics for production of inferior grade plastics.
3. Dumping industrial wastes on land and in water	Setting up sewage treatment plants near the industries and introducing pollution control measures in industries.
4. Emitting industrial gases in the air	Separating pollutants from harmful gases and making them harmless before releasing them in the air.
5. Defecating in the open	Constructing 'Sulabh Shauchalayas', especially near the slums.
6. Deforestation (clearing forests)	Planting trees (aforestation) on a massive scale.

INTEXT QUESTIONS 15.4

1. Choose the most appropriate answer:

   (i) Eco-friendly products mean things which are
   - a. very harmful to the environment
   - b. less harmful to the environment
   - c. not harmful to the environment
   - d. not very harmful to the environment

   (ii) Eco-friendly products are given
   - a. FPO mark
   - b. AGMARK
   - c. ISI mark
   - d. ECO mark

   (iii) Products are termed eco-friendly on the basis of their
   - a. production, use and disposal
   - b. disposal, recycling and dumping
   - c. production, distributing and recyling
   - d. use, disposal and distributing

2. Given below are some eco-friendly non eco-friendly products. Categorise them under their appropriate headings:

   polythene bag, water based paints, jute, nylon sari, unleaded petrol, solar cooker, earthen cups, crude motor oil, paper bag, canvas.

3. Match list A with list B and follow the pattern given in the example below.

List A	*List B*
e.g.: Deforestation	**Aforestation**
(a) defecating in open	(i) pollutants separated before letting out
(b) household wastes	(ii) recycling for industrial use
(c) industrial gases	(iii) Sulabh Shauchalaya
(d) industrial wastes	(iv) manure for garden
(e) municipal wastes	(v) sewage treatment plants
	(vi) land treatment plants

15.5 HOW CAN WE HELP IN ENVIRONMENTAL CONSERVATION

a) At home

— Adopt the principle of "3 R's" Reduce (consumption) Re-use (articles) and Recycle (wastes).

Notes

Waste land is the land which is degraded by sanitary land refills, or industrial wastes, etc.

Sanitary refill: After reducing to smallest volume, Municipal wastes are dumped in an enclosed area outside the city. The refuse is covered with soil for decomposition. This is called sanitary refill.

— use solar cookers and solar heaters as far as possible
— maintain sanitary conditions and adopt hygienic habits like no spitting or defecating in the open.
— ensure proper disposal of refuse, human excreta, etc.
— adopt family planning norms and keep the family small
— save water for the future. Use minimum water for all activities and avoid wastage
— avoid loud speakers to celebrate
— avoid smoking.

b) While going out

— live as close as possible to your office / school/college
— share cars and use unleaded petrol or compressed natural gas (CNG), if available
— use bicycles - good for your health too!
— use public transportation as much as you can.

c) Be close to nature

— each one plant one tree (take care of it too!)
— report any illegal felling of trees and cases of corruption pollution to concerned authorities
— contribute funds for wild life conservation
— spread awareness among your friends, families and relatives on how to make our earth GREEN!.

15.6 THE ROLE OF GOVERNMENT IN CONTROLLING ENVIRONMENTAL DEGRADATION

Man has now become conscious of long-term effects of environmental degradation. Government plays an important role in controlling the degradation of the environment. Some of the significant measures taken by the government are to:

— ensure that all industries are located far away from cities
— enforce strict laws for pollution control in industries as well as vehicles
— ensure that all industries set up waste treatment plants
— encourage the industries to link and reuse the wastes of each other, wherever possible, for example steel mills can use worn out parts of automobile industry
— insist on people adopting family planning norms
— provide efficient waste disposal systems for domestic wastes
— educate the public on the causes and effects of environmental degradation.

— motivate the people to use biogas, solar cooker, solar heater, etc.
— ensure healthy farm practices like using natural manures, crop rotation, mixed cropping, etc.
— motivate people to grow trees and care for them,
— conserve wild life by maintaining the forest reserves.

Activity 15.3: 1. Visit the local scrap-dealer's (Kabadi wala) shop. Find out where and how the following are disposed:

(i) Old newspapers and magazines

(ii) Metal and plastic items, and

(iii) Glass bottles.

2. Sort out your household waste as biodegradable and non biodegradable. Use the biodegradable wastes for making manure.

INTEXT QUESTIONS 15.5

1.. Correct the following statements and give reasons.

(i) It does not matter if people have large families.

.....

.....

(ii) All members of society should not be involved in environmental management programmes.

.....

.....

(iii) Household waste disposal is not important because final disposal of garbage will be done properly.

.....

.....

(iv) Waste lands cannot be cultivated for agriculture.

.....

.....

(v) Healthy farming practices include overcropping and use of chemical fertilizers.

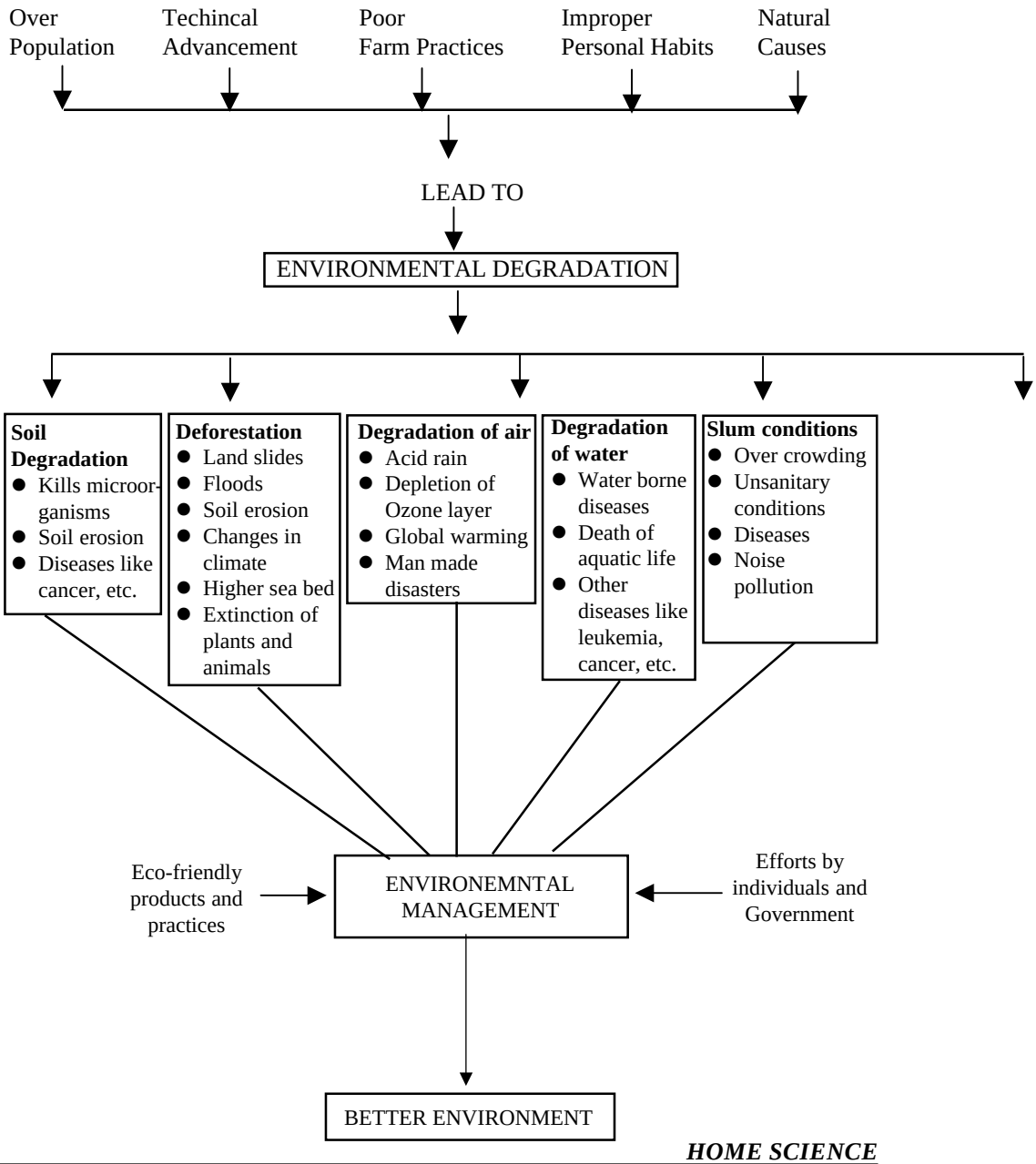
.....

.....

4. Rearrange the letters to indicate the correct terms for the following

i.	Avoid cutting trees	NTOSIFEAORTED
ii.	Pollutes the air	ISGOMKN
iii.	Melting of glass and metal for re-use	GCEIRCYLN
iv.	Eco friendly fuel for cooking	SGAOIB
v.	Recycling of household waste	EAMUNR

WHAT YOU HAVE LEARNT



TERMINAL EXERCISE

1. Define environmental degradation with two suitable examples from your day-to-day life.
2. What do you understand by the term 'eco-friendly'? List four examples each of eco-friendly products and eco-friendly practices.
3. Explain how forests help in conserving the environment. Analyse the effects of deforestation.
4. How does technical advancement lead to environmental degradation?
5. Briefly explain the effects of overpopulation on our environment.
6. Discuss the following effects of air degradation.
   (a) acid rain (b) global warming (c) depletion of ozone layer.
7. Present your plan to conserve your environment.
8. Compare the living conditions of a person living in a city with that of a person living in a village.

ANSWERS TO INTEXT QUESTIONS

15.1 1. (i) c, (ii) d

2. (a) iv (b) vi (c) vii (d) vi (e) iii (f) viii

15.2 (a) (i) erosion, fertility.

(ii) dust, heat, harmful gases

(iii) hardening of soil, soil

(iv) spitting, defecating in open, smoking,

(v) natural

15.3 1. (a) (v) (b) (iii) (c) (iv) (d) (i)

2. (a) acid rain (b) skin cancer and eyes (c) temperature

(d) respiratory, asthma, bronchitis (e) handicapped

(f) jaundice, malaria (any two)

(g) lukemia, allergy

15.4 1. (a) (iii) (b) (iv) (c) (i)

2. **eco-friendly**
   - — water based paints
   - — jute
   - — earthen cups
   - — paper bags
   - — canvas

   non eco-friendly
   - — polythene bags
   - — nylon sari
   - — crude motor oil

3. (a) (iii) (b) (iv) (c) (i) (d) (v) (e) (ii)

15.5

1. (i) People should have **small** families. Large families lead to many problems.

   (ii) Poorest members **should be** involved in environmental management programmes.

   (iii) Household waste should be properly disposed. Otherwise it leads to environmental degradation.

   (iv) Waste lands can be cultivated for agriculture.

   (v) Healthy farm practices include mixed cropping and use of natural manures.

   For giving reasons, refer text.

2. (i) Deforestration (ii) Smoking (iii) Recycling

   (iv) Biogas (v) Manure.

3. a) (iii), b) (iv), c) (v), d) (v), e) (ii)

AUDIO - Vayu Pradushan

VIDEO - Man and Environment

For more information log on to
http://www.cleanindia.org

16

321en16

HOUSEHOLD EQUIPMENT

You must be using a lot of equipments in your home to help you in doing your day-to-day jobs. These equipments help you not only to save your time and energy, but also to do your work more efficiently. You may use some of them for recreational purposes like a television and a music system. You may find that some of them remain in good working condition while others may require frequent repairs and replacements.

What do you do under such circumstances? Can you avoid these frequent trips to the market? Can you tell how? Yes, you can avoid these trips through proper selection, care and maintenance of these equipments. The market provides a wide range of equipments in terms of cost, quality, design, material used, etc. You also find standization marks and a guarantee on some of these equipments. What kind of knowledge do you need about these equipments? How can you select them properly? How can you take care of them? You will find answers to these and other similar questions in this lessons.

OBJECTIVES

After reading this lesson you will be able to:

- define the term 'equipment' and classify the common household equipments;
- describe the factors affecting the selection of household equipments;
- explain the points to be kept in mind for correct use of household equipments;
- enumerate the methods for proper care and maintenance of equipment;
- provide guidelines for conservation of fuel, electricity and water while using household equipments.

16.1 CLASSIFICATION OF EQUIPMENTS

All of us do our work in two ways - some of us work with our hands, and some others take help of certain things. These things help us to do our work in a better way.

Any thing that aids you in doing work is known as an equipment.

Some of these equipments need electricity to operate and some do not. Hence, we can say we have two types of equipments:

- Electrical and
- Non-electrical

(i) Electrical: Look around your home and try to identify some equipments which need electricity to work. Which are those items? Yes, you are right! These are items like toaster, mixie, immersion rod, iron, refrigerator, washing machine, geyser, etc. which can work only with electricity.

Fig. 16.1: Electrical Equipment

Fig. 16.2: Non-electrical equipment

(ii) Non-electrical: There is another category of equipments which do not need electricity to run. This category consists of kitchen utensils and tools, sewing machine, cooking stove, solar cooker, etc. These are manually operated. Some times, we can think of using

a non-electrical equipment instead of an electrical equipment eg. instead of a refrigerator which works with electricity, we can make use of a "Grameen Sheetal" which can help to keep our food cool.

The "grameen sheetal" consists of a small cupboard made of wire-mesh. This is kept covered with a jute cloth (taat) on all sides except the front. The ends of the jute cloth dip into bowls of water and hence remain wet constantly.

Thus, we use a number of things in the home to do our work. These things are called equipments. We use them to save our time and energy and also to increase our efficiency.

Efficient use of equipments includes their correct selection, operation and care, so that the homemaker can perform **maximum amount of work with minimum effort, in the shortest possible time.**

16.2 SELECTION OF HOUSEHOLD EQUIPMENTS

You have studied the classification of equipments that are generally used at home. You are also aware that these equipments have a variety of features and are available in different models, at different prices.

So, when you go to the market to buy any equipment, you should know the points to consider while making your selection. The criteria for selection of one equipment varies from another. Let us discuss them in detail here.

1. **Need-based:** Any equipment you purchase should fulfill your need. Do not purchase an equipment because others have it or it is cheap. For example, instead of buying a food processor with many attachments you can buy a simple mixer - grinder which will fulfill your need. This way you also save money.

2. **Time, money and energy saving:** When you are buying an item, see that it is useful to you in terms of saving your time and energy as well as your money.

   For example, a pressure cooker cooks food faster: hence you save time and you also save money because less fuel is consumed. You also save energy because it is simple to use and does not require much supervision.

   A sharp knife cuts fruits and vegetables easily hence you save your energy. Use of a blunt, cheap knife will not only cut the vegetables poorly, but would also be very frustrating to use.

3. **Easy to clean:** The equipments bought should be made of good material which is easy to wash, clean and maintain.

   For example, iron utensils are difficult to clean whereas stainless steel utensils can be cleaned very easily. A toaster with a removable crumb tray is

Notes

easy to clean as compared to a toaster fixed with a non-removable tray at the bottom.

4. **Safe:** Whatever you buy must be absolutely safe to use at home. Do you know which mark of standardization is used to guarantee the safety of electrical equipment? Yes, you are right.

ISI marked equipment is safe to use because it is properly checked and is of good quality. You must ensure that all electrical equipments that you buy carries this mark. Equipment without this certification may be cheaper but not safe to use.

Standardized Products: Those products which meet minimum standards of safety, durability and performance.

All electrical equipments should have a 3-pin plug and an insulated wire/cord. Do not select any electrical equipment which has exposed metal parts, as electric current may be conducted through these parts and give you a shock. In the case of non-electrical equipments, see that they do not have sharp edges, loose handles and knobs. Such equipment are also not safe to use since they can hurt you while using.

The equipment must also carry a guarantee of service. Guarantee of service means that the manufacturer takes responsibility for the working of that equipment for a specified period of time. The manufacturers of refrigerators may give a guarantee of 5 years, and manufacturers of ceiling fans may give a guarantee of 7 years. This means that for 5 and 7 years your refrigerator and fan should give you trouble free service. If any trouble appears, the manufacturer will repair it free of cost.

Guarantee : A promise for the efficient performance of an equipment.

It is very important for you to ensure that all equipment you buy, specially the costly equipment, should carry a guarantee of service. Ask the shopkeepers about those parts of the equipment which carry guarantee so that you are not cheated later. At the time of buying, see that the guarantee card is duly filled in and signed and stamped with the seal of the shopkeeper from whom you are buying the equipment.

5. **Cost:** Whenever you go to the market, what is the first thing that you want to know? Yes, it is the cost of the item.

While some equipments which are simple do not cost too much, there are some which have more complicated parts or attachments and are quite costly. They are expensive because they perform more functions.

For example, a refrigerator is very costly whereas a "grameen sheetal" is much cheaper. But when used, a "grameen sheetal" will not be able to do all that a refrigerator can. You can get ice, keep food and water cool, make ice-creams, preserve food, etc., in a refrigerator but not in a grameen sheetal. A grameen sheetal will last for a few years only whereas the refrigerator will last for many years.

Hence, after seeing the advantages, provided one can afford it, one would be quite right in selecting the costlier refrigerator. This is not true in all coses. For example, it would not be advisable for a housewife to buy a complicated and expensive model of a sewing machine when she needs to do only simple repair work at home.

6. **After-sales service:** When an equipment is constantly used, it is bound to undergo wear and tear in due course of time. If you need any service, repair or replacement of parts of an equipment, then it should be conveniently available at an affordable price. Therefore it is necessary to make sure that after-sales service is available at the local market place. An equipment with a good after-sales service is always the right choice!

INTEXT QUESTION 16.1

1. Fill in the blanks

   (a) Equipments are classified as _____ and _____.

   (b) Efficient use of equipment includes their correct selection, _____ and _____.

   (c) _____ is a promise for efficient performance of an equipment.

   (d) The foremost criteria for the selection of an equipment is _____ based.

   (e) An equipment that can perform a number of function is generally more _____.

   (f) Good after-sales service ensures easy _____ and _____.

2. State which of the following statements are true (T) or false (F). Justify your answer.

   a) Only electrical equipments are labour saving.

   .....

   .....

   b) Non-electrical equipments are manually operated.

   .....

   .....

   c) Standardized products ensure safety and durability.

   .....

   .....

d) An ISI mark is given to all electrical equipments.

.....

.....

e) Expensive equipments fulfill family needs more than inexpensive ones.

.....

.....

Activity 16.1 : Visit an electronic and electrical goods shop and find out the following details of a refrigerator and television. Record the following details:

Details	*Refrigerator*	*Television*
- brands and models (size and features) - cost - after-sales service - guarantee		

16.3 CORRECT USE OF HOUSEHOLD EQUIPMENTS

The use of an equipment is, no doubt, beneficial for everyone in terms of the time, labour and energy that are saved but at the same time, there are a few precautions everyone must observe while using it. This will ensure you a long trouble - free service from that equipment.

Can you say why it is necessary to take precautions? Because if we are careless, serious accidents can occur which can even endanger our life.

Here are some points which you must keep in mind while using any equipment.

- Read the instructions given with the equipment and follow them strictly.
- See that the wire and plugs of all electrical equipment are in proper order and there is no leakage of electricity. Remove the plug before cleaning an equipment to cut off the power supply.
- Keep all electrical equipment away from water taps. Do not wash these equipments with water unless the instructions say so.

Can you tell why? Yes, it can give you a shock.

16.4 CARE AND MAINTENANCE

While it is important to select good quality equipments it is equally important to take proper care of these equipments for trouble free and long service. Some simple care and maintenance measures will help you to achieve this.

These are listed below.

- Do not touch any electrical equipment with wet hands or feet.
- If you get even a light electric shock from any equipment, do not use it again untill it has been repaired.
- When you plug in the electrical equipment, see that its wire does not come in your way when you walk. Can you tell why? Yes, you may trip over it and fall. Make sure that the plug is tightly fixed in the socket and the wire is securely tightened with a 3-pin plug.
- Check to see that proper fuses are installed in the main electric supply board so that there is very little chance of a fire due to an electrical short circuit. A fuse cuts off supply of electricity to the equipment the moment anything goes wrong. You can also use a mini-circuit breaker (MCB) for your electrical connections. A MCB cuts off electric supply when there is an extra load or there is a short circuit or when the voltage increases suddenly.
- Do not wear synthetic clothes while working in the kitchen. Why is it important to ensure this? Nylon catches fire easily, melt and sticks to the skin causing very deep burns.
- Use pans with bakelite or wooden handles. In case there are no handles, use a napkin or tongs to remove them from the stove or chullah. Never use your own dupatta or sari pallu for this purpose.
- Thoroughly clean all household equipment after every use with due precautions. Wipe the outside surface of an equipment to prevent deposits of dust and grease.
- For a kerosene stove, fill the tank upto about 2/3 rd level of the oil tank to avoid bursting of the tank. Do not refill kerosene oil in a cooking stove or a generator while they are on.
- Immediately replace the cracked rubber tube of a LPG stove and the worn-out, cut or exposed wires of electric equipment. The gasket of a pressure cooker also needs to be replaced if it becomes loose or hard.
- Turn off the knob of a LPG cylinder whenever it is not in use to prevent leakage of gas.
- Carefully store equipment with sharp blades or edges so that their sharp ends do not cause any injury. For example, a knife should be stored vertically with its blade pointing down wards. When you pick up the knife for use, your hand will touch the handle first.

- Always keep the vent pipe of a pressure cooker unclogged and clean to ensure smooth flow of steam. Do not try to remove the weight from a pressure cooker till the pressure comes down. Wait for the hissing sound of steam to stop before opening the pressure cooker lid.
- While using non-stick utensils, do not use metal spoons or ladles for stirring as this can damage the non-stick coating. For the same reason, do not use a hard scrubber to clean these utensils after use.
- To ensure smooth running of a sewing machine keep it clean and oil its parts regularly.
- While using a microwave oven do not use metal containers, use only microwave oven proof containers. Follow instructions carefully before every use.

INTEXT QUESTIONS 16.2

Fill in the blanks by using the most suitable words from the list given below.

Wire, microwave oven, synthetic, plug, MCB/fuse, accidents, vent pipe, warm.

1. Careless use of household equipments can cause serious _____.
2. Before cleaning an electrical equipments the _____ should be removed from the switch board.
3. A _____ fixed on the electrical main point cuts off the power supply by breaking the circuit.
4. _____ clothes should not be worn while working in the kitchen.
5. The _____ of a pressure cooker should be kept unclogged and clean to allow steam to pass freely.
6. Metal containers should not be used while cooking in a _____.

16.5 CONSERVATION OF FUEL, ELECTRICITY AND WATER

So far you have leant how to select household equipment and their use. Now, you need to know about conserving important resources like electricity, fuel and water as their supply is very limited. We need to conserve them to ensure that they are not exhausted and are available in the future too. We can also save money in this manner. Let us find out how we can do it.

- **Fuel**

You need to conserve fuel like gas, kerosene oil or wood used at home. How can you do this?

Follow the simple tips given below:-

- Clean the burner of your stove (gas/pressure/wick) regularly.
- Before cooking, allow frozen food to come to room temperature, as it will use less fuel to get cooked.
- Soak pulses, dals and rice for sometime before cooking.
- Always use a pressure cooker instead of an open pan as it will use less fuel. Try to cook as many things (eg. rice, dal, vegetables etc.) as possible at one time in the pressure cooker, using the separators.
- If you are using the pressure cooker, lower the flame after the pressure is built in the cooker ie. after the first whistle.
- Cover the pan while cooking.
- Allow hot food to come to room temperature before storing in the refrigerator.
- Use solar cookers for cooking to save fuel.

Activity 16.2: Soak 250 gms of dal and then pressure cook. Also cook the same kind of dal without soaking. Compare the time taken for cooking soaked dal with the time take for cooking unsoaked dal.

- **Electricity**

You know that light is very important for all of us to see things properly. Lighting is available naturally, i.e., through sun and artificially by the use of electric bulbs/ tubes. Electricity is a form of energy. This is used in the home in two ways:

(1) To produce heat or light - using iron, toaster, immersion rod, light bulbs, etc.

(2) To produce movement by means of a motor ie. for running equipments like fans, coolers, refrigerators, mixer, grinder, etc.

We have to pay for the electricity used, which is becoming very expensive now-a-days. So you have to be very careful while using electricity at home. You can conserve electricity by following very simple steps:

- Avoid frequent opening of the refrigerator door. Plan all your activities to keep and take out things from the refrigerator at the same time.
- Switch off all the lights and fans when you leave a room.
- Use a low wattage tube light for general lighting in your bathroom, toilet, garden, etc.
- Minimise the use of geyser, washing machine, mixer-grinder, etc.
- Keep your electrical appliances in good working condition. If any part is defective, get it repaired immediately.

- Increase the use of solar lantern, cooker and water heater to save electricity.
- Use tube lights and CFLs (compact fluorescent lights) instead of incandescent bulbs.

The modern home has equipments like televisions, telephones (landlines and cellphones), computers, fax machines and answering machines, music systems etc. We should use them discretely, avoid their misuse to reduce their running costs. For example, keeping the televisions on throughout the day will increase the electricity bill. We should also ensure that they do not create noise pollution and disturb others.

Activity 16.3 : Try and follow the tips given here for conserving electricity at home for a month, and

(1) Compare the electricity bill for this month with the earlier months.

(2) Think of similar methods for saving your resources and find out the savings you made in each case.

- **Water**

Everyone is familiar with the water shortage these days. It is very essential that not a single drop of water be wasted. Do you know how you can do this?

Yes, there are a number of ways by which water can be conserved. Look at the illustration given below. It clearly indicates the amount of water each activity consumes.

Fig. 16.3

Given below are some of the methods for conserving water:

- Water used for washing clothes can be used for cleaning and mopping floors in house especially the staircase and verandah.
- Water used for washings fruits and vegetables can be used for watering plants in the garden.
- Bathing from water filled in a bucket consumes less water as compared to a shower bath.
- Take water in a vessel for washing fruits and vegetables rather than washing them under running water.
- While brushing your teeth or washing face take water in a mug, rather than using a running tap.
- Use a bucket and mug for watering the plants and washing your car instead of using a pipe.
- While filling the water cooler, do stand there, otherwise the water will over-flow.

Can you think of more such ideas? Try all those ideas and if they work in reducing water wastage, share them with your friends and neighbours.

Activity 16.4 : Calculate the total quantity of water your family needs in a day. Another day, while washing clothes, do not throw away the water. Collect it. Use it for mopping the house and cleaning the car. Think of alternative methods for which you can utilize the water. Try to estimate the amount of water you will save if you do this for a week, and for a month.

INTEXT QUESTIONS 14.3

(1) What do you understand by conservation of electricity at home? Explain with examples.

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(2) State four points you would keep in mind for conserving fuel at home.

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Notes

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(3) Write 'True' and 'False' for the statements given below.

Give reasons for your answer

(a) A stove burner does not require regular cleaning.

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(b) Repeated whistles of pressure cooker kept on high flame indicates fast cooking.

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(c) Tube lights and CFLs consume less electricity.

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(d) Keep the tap running while brushing.

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(e) While cooking food in a pan, do not put the lid on the vessel.

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(f) Washing a car with water collected in a bucket saves water.

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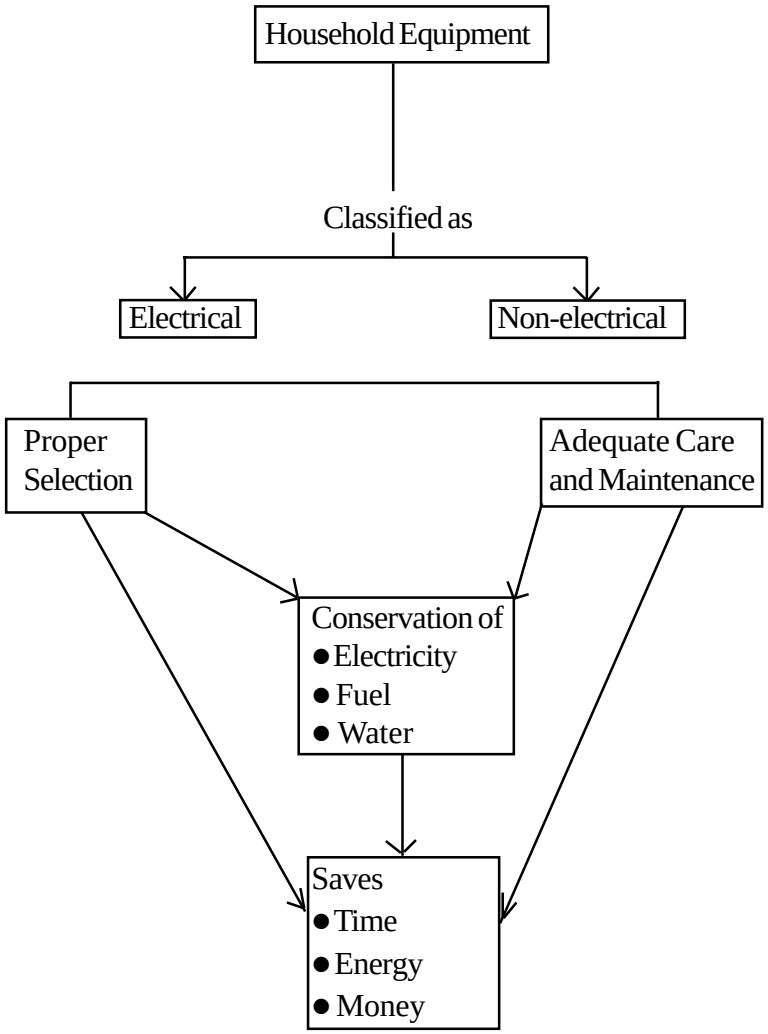
WHAT YOU HAVE LEARNT

In order to make it easier for you to remember, here are the main points of the lesson:



TERMINAL EXERCISE

1. Define the term "labour saving device".
2. State the points you will keep in mind while using electrical equipments at home.
3. What is "grameen sheetal"? Discuss its utility.
4. List five factors to be kept in mind while selecting household equipments.

5. State four guidelines for proper care and maintenance of household equipments.

6. Which of the following actions are unsafe and why?
   a) Wearing nylon clothes while working in the kitchen.
   b) Refilling oil in the stove or generator while it is still on.
   c) Using a cracked tube to connect the gas cylinder to the gas stove.
   d) Using nylon scrubbers to clean non-stick pans.
   e) Forcing the steam out of a pressure cooker by lifting its weight.
   f) Removing the plug before touching the electrical equipments.
   g) Operating electrical equipments with wet hands.

ANSWERS TO INTEXT QUESTIONS

16.1

1. a) electrical, non-electrical
   b) operation, care
   c) Guarantee
   d) Need
   e) Expensive
   f) Repair, replacements.

2. a) F b) T c) T d) T e) F

16.2

1. Accidents 2. Plug 3. MCB/fuse 4. Synthetic
5. Vent pipe 5. Microwave oven.

16.3

1. Refer to text

2. Refer to text

3. a) F b) F c) T d) F
   e) F f) T

ANSWERS TO TERMINAL EXERCISE

Refer to text for 1-5

6. Unsafe actions: (a) (b) (c) (d) (e) f) (g)
(For reasons refers to text)

For more information log on to
http://dbs.extension.iastate.edu/answers/projects/answerline/questions/Household Equipment.html.

17

321en17

CONSUMER EDUCATION

All of us use a variety of products everyday. A few of these products can be made at home, while for others we have to go to market and buy them from the shops. Even for the ones that we make at home, we need raw materials which we buy from the market. What has been your experience while shopping? Have you always found goods as per your requirement? Have you been totally satisfied by your purchases? Do advertisements and sale persons always give you correct and complete information about the products you want to buy?

India is one country where a lot of people are ignorant and ill informed. They rely on the information and guidance provided to them by the manufacturers and shop-keepers. A number of these manufacturers and shopkeepers want to make quick and easy money even if it means at the cost of the health and safety of innocent people. Under such circumstances how can we make a satisfactory purchase without being cheated ? How do we get the best return for our money?

Let us discuss these and other related questions in this lesson.

OBJECTIVES

After reading this lesson you will be able to:

- define the terms “consumer” and “consumer education” and explain their importance;
- list the problems faced by consumers and suggest possible solutions for these problems;
- specify rights and responsibilities of the consumer;
- describe the laws for consumers protection.

17.1 DEFINITION OF A CONSUMER

Let us first see, who is a consumer.

> Consumers are people who buy goods and services to satisfy their needs.

As is clear from the above definition, we buy a lot of things to fulfil our needs. These may include "goods" like food, clothing, fuel, paper, electronic items, etc. "Services" are the facilities offered to us by various agencies with or without payment. These include water, electricity, health and sanitation, education, transport, communications, etc. Thus, by the above definition we are all consumers irrespective of our age, social and economic background and level of education.

17.2 CONSUMER EDUCATION

Consumers are cheated in the market because they do not get proper "consumer education".

> Consumer education means to educate the consumers as to what, where, when, how and how much to buy and how to use what they have bought.

If you understand the above definition, you will be able to appreciate the relevance of educating people so that they can make correct purchases. Consumers are cheated in the market because they do not get proper "consumer education". Consumer education has today become an important part of school and college curriculum. That is why you are reading this lesson. As per the definition of consumer education we want you to learn about the following:

Fig. 17.1

Fig. 17.2

● **What to buy:** You should buy those products that meet your needs and priorities and are of good quality. Before buying, conduct a market survey and collect as much information as possible about the product. Then decide about a particular brand. Brand name is the popular name by which a product is known in the market like Dhara for vegetable oil, HMT for wrist watches etc.

- **How much to buy:** Buy just the right quantity as per your need, money and storage space available. This prevents spoilage and wastage.
- **Where to buy:** Purchases can be made at retail shops, cooperative stores, company showrooms, authorised dealers or at wholesale markets.
- **When to buy:** Some goods should be bought when they are in season (fruits and vegetables) others should be bought during off season or in genuine discount sales (room coolers, electric heaters, woollen clothes etc.). Visit shops when the shopkeepers are relatively free. Avoid Sundays and evenings as far as possible.
- **How to buy:** Things can be bought either in cash or on credit. You pay less when you pay cash and if you buy on credit you end up paying more than the original price. You may save and buy by paying cash, or buy on credit with instalment payments. Analyse the terms and conditions in the case of instalment purchases. If it is worthwhile, buy the goods on instalments rather than exhausting your savings cash reserves. Choice is yours! Also ask for the gurrantee and warranty cards along with the receipt, it is your right!

Fig. 17.3

- **How to use:** Learn about the proper use of any product or service. Read instructions carefully before use and always follow them to avoid any problem. You can also ask for a demonstration of usage.

Advantages of Consumer Education

What do you think are the benefits of consumer education? How can you put to use what you have learnt so far? Well, you may probably say that it helps you to:

— develop the ability to decide and choose things intelligently,
— demand safe, reliable and good quality products at a reasonable price,
— be alert, well informed and vigilant against corrupt practices in the market, and
— take suitable action when faced with a problem.

All the points listed above are the advantages of consumer education.

INTEXT QUESTIONS 18.1

1. Indicate whether the following statements are true or false by writing T or F again each statement. Justify your answer in the space provided.

   (i) Children are not consumers.

.....

.....

(ii) Sales persons are not the only source of providing information about a product.

.....

.....

(iii) When goods are available at a lower price, it is wise to buy them in as much quantity as is available.

.....

.....

(iv) Room coolers and fans should be bought preferably in winters.

.....

.....

(v) It is better to buy expensive durable goods on instalments rather than not buy them at all.

.....

.....

17.3 PROBLEMS FACED BY CONSUMERS

When buying products from the market you may face certain problems. Let us discuss some of them.

17.3.1 Price Variation

Many times while purchasing products you may notice that the price of the same item is different in different shops within the same market. There are also price variations between markets. Why do prices vary? Sometimes prices vary due to certain genuine reasons and at other times, they vary because the salespersons want to over-charge you. Let us understand the reason first:

— Prices are lower for the same product in wholesale markets as compared to retail markets.

— Prices of packed products are higher than the price for the same product when sold loose. This is due to packaging charges in packed goods.

— Maximum Retail Price (inclusive of all taxes), also called MRP, printed on the label of all products includes the commission of the seller. If he is ready to forgo a part of it, he sells the product at a price lower than the MRP to attract consumers and make them regular customers.

— Purchasing power of people varies in different localities. The sellers charge more from people who have the capacity of paying more , for example they claim that they provide the products clean and well packed, showroom is clean, attractive and the customer can move around and select the products, there is also facility of free home delivery.

— Products are sold at a reduced price during the "end-of-season" sales or at a discounted rate during "stock clearance" sales or for early birds.

— Products of better quality cost more than the lower quality ones or those nearing the expiry dates.

Some of the ways in which sellers over-charge you are :

— Selling a copy of the popular brand name.

— MRP for certain products varies in different states. These are mentioned on the label, and the shopkeeper takes advantage of this to charge the highest mentioned MRP.

— Selling items loose without a label or packaging so that you cannot read and check its real price.

17.3.2 Adulteration and Poor Quality

Adulteration means addition of certain things or their removal from a product, thereby, lowering its quality. Adulteration can also occur because of the use of poor quality raw materials or poor method of production or inappropriate storage of finished products. Adulteration is usually intentional. Such products may be harmful for the health and safety of consumers. However, all low quality products may not necessarily be adulterated ones.

You may have heard of people suffering from diarrhoea and vomiting after eating food and sweets from roadside hawkers. This may be due to adulteration of the food with harmful colours, stale ingredients, poor quality cooking oil, etc. These food items may also have been contaminated with germs. Therefore it is important that we critically evaluate nutritional claims from advertisements and nutrition related news stories. Cases of people getting electric shocks from poorly designed electric irons and immersion rod may also not be new to you. Many fabrics shrink or the colour fades after the very first wash. Readymade garments that are stitched badly or have loose buttons are the other examples of poor quality products.

17.3.3 Non-availability - Hoarding and Black Marketing

There may be occasions when you do not find certain products in the market. This non-availability may be because of any of the following reasons:

Fig. 17.4: Black Marketing

— Genuine and unavoidable reasons like off-season, lower production or less supply due to transporters strike or a natural calamity like drought or floods.

— Artificially created reasons by traders to demand a higher price from you. This is due to hoarding or hiding of certain products and their sale in black market i.e. at unreasonably high prices to needy consumers. Many times, when the manufacturers want to raise prices, they temporarily withhold the supply of their products from the market, thus causing artificial scarcity. Even in normal periods, when the sellers expect a rise in prices, they hoard products. For example, you may find such a situation for petrol, butter, cooking oil, etc., in the months of January and February, that is, just before the budget and Government announcements of new policies on taxes, duties, etc.

17.3.4 Defective Weights and Measures

Shopkeepers use several malpractices while measuring or weighing what you buy. These may be:

— use of irregular weights like bricks or stones or hollow bottom of iron weights which weigh less than the actual weight,

— use the weighing balance with a wooden beam that does not remain horizontal when the pans are empty,

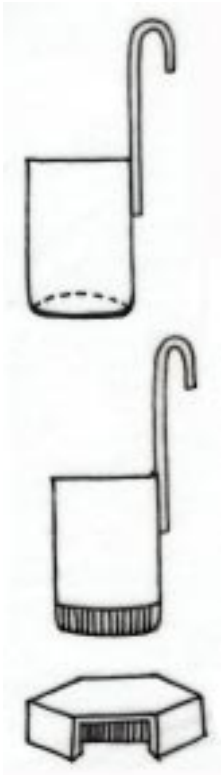
— pointers of weighing scale that do no rest at zero even when no weight is put on the pans,

— placement of a piece of magnet or cardboard under the pans of a weighing scale,

— meters at petrol pumps and in auto-rickshaws and taxis not showing zero readings,

— use of a measure that may be dented or with a false bottom to give less measurements of liquids like milk or oil,

— use of a short or dented measuring rod, or by streching the fabric or measuring the fabric on marked table tops to measure less fabric, etc. The shopkeepers' intention all the while is to give you less than the promised quantity without your knowledge, thereby earning higher profits.



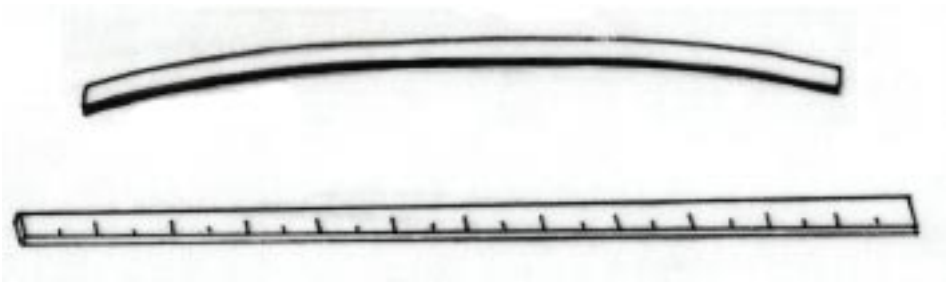


Fig. 17.5 : Various methods of cheating consumers in weights and measures.

17.3.5 Deceptive Trade Practices

You may have observed some of the following deceptive trade practices by shopkeepers and manufacturers:

— packing of small goods in large packets and packing poor quality goods in stylish wrappers that cannot be opened for examining the products inside.

— use of brand names, labels and packaging similar to good quality popular products for low quality products.

— offer of attractive free gifts, sales and discounts with some low quality products or offer of cheap free gifts and discounts that are not genuine, etc.

— selling expired articles at lower prices.

— polishing and packing second hand articles for selling them at first hand prices.

Thus, consumers are deceived and cheated.

17.3.6 Poor Consumer Guidance

We have to often rely on the mercy of shopkeepers and manufacturers for information required to make any purchase. But they do not always give us the correct and complete information or they may themselves not have sufficient information. They talk positively about only those brands of products that they stock and get a higher commission. Some salespersons do not pay attention to consumers. They behave rudely and do not show all the items. Thus, the consumers get very little help from these salespersons while making choices. Also there are no standarized consumer booklets available that one can refer to.

17.3.7 Lack of Standardised Products

While shopping have you ever noticed that some products bear a quality standard mark like ISI, AGMARK or FPO, along with some numbers? What do they mean to you? Well, these marks are called standardization or certification marks and are issued by the Government. The numbers displayed along with the marks are the numbers of Indian standards corresponding to a product and unique for it. These marks convey that products bearing them are of good quality, correct weight and safe to use. You will read more about these marks later. However, all the products sold in the market including some very popular brands do not bear a standardization mark. For example, when you buy a pressure cooker, you may be un-

Fig. 17.6 : Way to standardised products

sure and unable to decide whether to buy a popular brand without a standardization mark or to buy a less popular brand with a standardization mark. This leaves the consumer confused.

Some incidences of misuse and misrepresentation of standardization marks have been reported wherein fake or duplicate products have been found bearing these marks.

17.4 SOLUTIONS TO CONSUMER PROBLEMS

Having discussed the numerous problems that a consumer can face in the market today, what suggestions can you give to overcome these? Compare them with the solutions given below.

— Always conduct market surveys and tap all the sources of information (TV, magazines, newspapers, salespersons, and if possible some body who is already using the product) before buying a product.

— Buy from Kendriya Bhandar, fair price shops, authorised company showrooms, cooperative stores or other reliable shops of good reputation in your area. This will enable you to buy good quality products at right price.

— Obtain bills, receipts and gurantee cards for all purchases made and keep them safely. They will be of use in case of any fault in the products.

— Instead of loose items, preferably buy properly packed and labelled products.

— Read labels carefully for brand names, ingredients, nett weight, MRP (maximum retail price), expiry date and standardization mark.

— Think of alternate items, for those that are in short supply. Refuse to pay more and discourage hoarding and black marketing.

— Do not accept irregular weights like bricks and stones. Be alert and vigilant about the weights and measures and the procedure used by the seller.

— Do not get deceived by sales tricks and sales talks, like free gifts and high discounts.

Fig. 17.7: Misleading use of standardization marks

— Buy products that gurantee good quality and after-sales service.

— If you notice any trader cheating or using unfair trade practices do not remain quiet. Report such cases to the concerned authorities.

INTEXT QUESTIONS 17.2

1. Fill in the blanks choosing the correct words from the brackets.

   (i) The MRP is the ..... price at which a product is sold in the market. (minimum/maximum/moderate)

   (ii) Food items sold loose have high chances of ..... (theft/breakage/adulteration)

   (iii) Hiding away of scarce products and their sale at a high price is called ..... (hoarding/profiteering/black marketing)

   (iv) Sale of small soap cakes in large packets is a ..... sale practice. (deceptive/positive/effective)

   (v) Shopkeepers and manufacturers should provide the consumer with all the .....to enable them to make a wise purchase. (discounts/information/gifts) .

   (vi) Products bearing ..... marks are of good quality (identification/trade/standardization)

2. List any two effective solutions to consumer problems.

Activity : Visit a local market and observe the sellers weighing their products. Make a note of fair and unfair measures used.

17.5 CONSUMER RIGHTS AND RESPONSIBILITIES

Do you know that as a consumer you enjoy certain rights? These rights have been formally given to us by the government under the **Consumer Protection Act.** Let us learn about them.

17.5.1 Consumer rights

1. **Right to safety:** This right protects us against products and services that are harmful to our life and property like adulterated food and unsafe electrical appliances.

2. **Right to be informed:** This gives us the right to be informed about the quality, quantity, and price of goods and services. Hence all products must have a lable and this information mut be mentioned on the label.

3. **Right to choose:** This entitles us to the right to have access to a variety of goods and services of satisfactory quality at a reasonable price.

4. **Right to be heard:** This gives us the right to voice our protest against any malpractice of the traders and oppressive government policies, and receive due consideration.

5. **Right to redressal:** This means that we have the right to a fair settlement and compensation for genuine and just complaints against faulty goods and services.

6. **Right to consumer education:** This enables us to acquire knowledge and abilities to make wise choices.

The rights mentioned above have been accepted all over the world. A knowledge of these rights will helps us to protect ourselves against the various unfair practices of traders. However we should be careful and not misuse them.

17.5.2 Consumer Responsibilities

If you want to enjoy certain rights you have to fulfill certain responsibilities as well. You must always try and behave in a responsible manner and develop good purchasing habits.

Following are some of your responsibilities.

— Take bills, receipts, guarantee cards, etc., and keep them safely and maintain them as records. They are the proof of your purchase and help in getting redressal in case of genuine grievance.

— Insist on buying good quality products with standardisation marks, even if they are not of popular names. This will help in removing substandard products from the market.

Fig. 17.8 : Solutions to consumer problems

— Do no let yourself get carried away by sales talks, attractive labels, packaging, free gifts and advertisements and other such sales tricks or gimmicks.

— Follow the manufacturer's instruction for use, care and maintenance of a product carefully.

— Do not misuse the customer services offered by manufactures and shopkeepers like free home delivery, exchange within a specified period, credit, etc.

— Report cases of cheating and encourage other consumers also to do the same. Cooperate with law enforcement agencies in getting the guilty traders punished.

— Do not waste any product. Make an effort to conserve resources so that they can last longer.

INTEXT QUESTIONS 17.3

1. Which of the following are consumers rights? Tick (√) the correct answers:
   - (i) Right to discount
   - (ii) Right to choose
   - (iii) Right to safety
   - (iv) Right to free home delivery
   - (v) Right to be heard
   - (vi) Right to standardized products
   - (vii) Right to information
   - (viii) Right to technology
   - (ix) Right to communicate
   - (x) Right to consumer education
   - (xi) Right to computer education
   - (xii) Right to redressal
   - (xiii) Right to return
2. Fill in the blanks with the correct answer.
   - (i) ..... should be kept safely as it is a proof of purchase of product.
   - (ii) Incidences of cheating and unfair trade practices should be ..... to the concerned authorities to punish the guilty;
   - (iii) To ensure long life of an electrical gadget it is very important to follow its manufacturer's .....for use, care and maintenance.
3. Read the folllowing problems and state the right the person will need.
   - (i) Mohan went to a shoe palace. Now he is trying to decide which one to buy out of Lotus Bawa, Adidas, Reebok and Nike.

     Right to.....
   - (ii) Radha bought an immersion rod a few days back which stopped working. She goes back to the shopkeeper and wants it either replaced or rectified by the shop owner.

     Right to.....

(iii) Mina bought a tin of desi ghee. When she opened it, it was smelling bad. She went to the shopkeeper who refused to hear her complaint because of which she wanted to be heard and approached the consumer court.

Right to.....

17.6 LAWS FOR CONSUMER PROTECTION

Fig. 17.9

Our government has passed certain laws to protect our rights as consumer. Under these laws any consumer with a genuine grievance can file a formal complaint against a trader and take him to court. These laws are briefly discussed below.

— **Agricultural Produce (Grading and Marking) Act:** Under this Act, the AGMARK standardization mark is given by the Government to agricultural or farm produce (e.g. wheat flour, gram flour, honey, spices, ghee, etc). This law ensures that these products are tested for purity, graded according to their quality and packed suitably.

— **Drugs and Cosmetics Act:** It regulates and ensures that only standard quality medicines and cosmetics are sold in the market with a proper cash memo or bill.

— **Prevention of Food Adulteration Act:** This law protects the consumer against adulterated and spoilt food stuff.

— **Essential Commodities Act:** As per this Act, the Government ensures that all the goods and services essential to life are available in the market at a reasonable price. The Government list of essential commodities includes items like cereals, pulses, sugar, raw jute, cotton and woollen textiles, medicines, paper, coal, petrol and petroleum products, iron, steel, cattle fodder, etc.

— **Monopolies and Restrictive Trade Practices (MRTP) Act:** This act protects consumers from being exploited by unfair trade practices like giving false or misleading statement and advertisements, sale of substandard products, hoarding and blackmarketing. It also prevents traders from conducting any contest or lottery with no intention of giving the promised prizes.

— **Standards of Weights and Measures Act:** This Act prevents the use of non-standard weights and measures. It makes it compulsory for all products to bear a detailed label. You will learn about labels later.

— **Fruit Product Order (FPO):** Under this Act, it is compulsory for all manu-

facturers of fruit and vegetable products to maintain a certain standard in respect of quality, packing, labelling and sanitary conditions during production, storage and sale. It ensures that safe canned, preserved and processed products like pickles, jams, juices, squashes, frozen vegetables and fruits are sold in the market. All products that meet the FPO specification are given the FPO standardization mark.

— **Consumer Protection Act (CPA/COPRA):** This Act clearly defines consumer rights and responsibilities. It seeks to provide consumers with quick, easy and inexpensive redressal of their genuine complaints. Under this Act, the consumers can file complaints against goods and services provided by not only private companies but also the Government departments. For the legal settlement of complaints, courts have been set up at the District, State and National level. Such courts are called Consumer Redressal Forums.

— **Bureau of Indian Standards (BIS) Act:** Under this Act, the quality certification mark ISI is given to those products which meet the specifications and standards set by the Bureau of Indian Standards. The BIS gives specification for products in terms of material used, method of production, labelling, packing, storage and sale. For quality control the BIS conducts surprise checks of the ISI marked products. This Act also prohibits the improper use and misrepresentation of the ISI mark. Examples of products bearing ISI mark are ghee, biscuits, detergent, pressure cooker, electric iron, immersion rod, geyser, LPG cylinders, etc.

INTEXT QUESTIONS 17.4

1. Match the items listed in column A with laws mentioned in column B, under which you can file complaints if these are unsatisfactory.

Column A		Column B	
(i)	Medicines	(a)	Fruit Products Order
(ii)	Ghee	(b)	Bureau of Indian Standards Act
(iii)	Misleading advertisements	(c)	Drugs and Cosmetics Act
(iv)	Pickles	(d)	Essential Commodities Act
(v)	Pressure Cooker	(e)	Prevention of Food Adulteration Act
(vi)	Aritificially coloured sweets	(f)	Agricultural Produce (Grading/ Marking) Act
		(g)	MRTP Act
		(h)	Standards of Weights and Measures Act.

17.7 STANDARDIZATION MARKS

Standardization Marks: You have read about standardization marks in the previous pages. What is standardization? What are standardization or certification marks? On which products are they found? How to recognise them? For the answer to all these questions read on.

> A standardization mark is a mark given to a product which meets certain standards with respect to the quality of the product in terms of material used, method of manufacture, labelling, packing, sale and performance.

Look around in your house and check various items for the following marks. Where have you seen them?

ISI Mark: This mark is given by the BIS over specifications and method of testing products.

15000 standards covering a variety of vegetable, fruit and meat products, processed foods, vanaspati, soaps, detergents, paper, paint, nonstick utensils, electrical goods, stoves, LPG cylinders, cement etc. are given ISI marks.

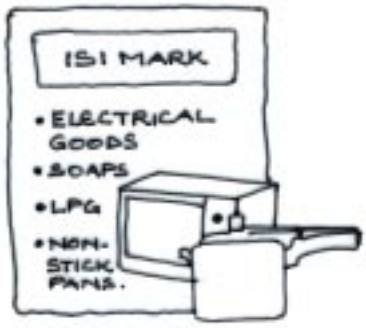


Fig. 17.10: ISI Mark

Fig. 17.11: Agmark

AGMARK: So far, standards have been prescribed for about 142 agricultural, horticultural, forest and livestock products, like wheat floor, pure ghee, honey, and spices.

FPO: This mark requires all manufacturers of fruit and vegetable products to acquire a licence for their production and sale after meeting the FPO standards. Products like jams, pickles, squashes, juices and ketchups are given FPO mark.

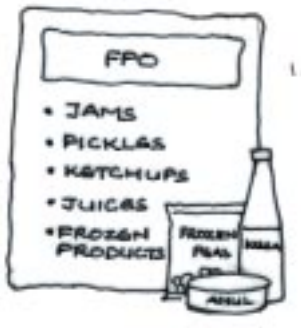


Fig. 17.12: FPO

Wool Mark: A standard mark of International Wool Secretariate was established in 1949. It promotes pure wool products. It makes it necessary for manufacturers to mention the amount and identity of other fibres used along with pure wool on the label of wool and woolen garments.

ECO Mark: It has been launched recently by the BIS. It is given to those products which not only meet ISI standards but are also recyclable and save energy; that is, they are environment friendly. Such products help in reducing environmental pollution.

Fig. 17.10: Eco Mark

Nowdays you might have observed a green or red dot on the label and advertisements of vegetarian and non-vegetarian food products. This mark is given in the form of a dot enclosed in a square. When this symbol is green, it is a vegetarian product, whereas a red symbol indicates the use of non-vegetarian ingredients. This symbol is useful to identify vegetarian and non-vegetarian food products according to your eating habits. This mark is an additional information provided by the manufacturers to help the consumers make an informed choice. You can see this symbol on certain medicines also.

The standardization marks discussed above have been laid down by the Government to prevent poor quality, duplicate and unsafe products from coming into the market. Thus, they help you to make wise choices without wasting your time, energy and money.

Labels : A label may be a piece of paper with information engraved or attached on to the packaging of a product. It gives you the following important information about a product.

- Name of the product
- Brand name
- Manufacturer's name and address
- Contents/Ingredients
- Use of the product
- Directions for use, care and maintenance
- Dates of manufacture and expiry
- Dosage in the case of medicines
- Nett weight / volume / length
- Maximum retail price (MRP) inclusive of all taxes
- Warning and precautions
- Guarantee period

You must develop the habit of reading labels carefully before buying a product.

Once we get into the habit of reading labels it will be very beneficial. This way we get information about the consequences of various consumer products. We can also save ourselves from substance abuse, eg tobacco, alcohol. For example, if you read a label on the cigeratte packet it reads "Smoking is injurious to health". Reading this can encourage you not to smoke.

Packaging

Packaging refers to the container or wrapper in which a product is kept for marketing and sale. A good package helps you in many ways:

- it protects the products from damage, breakage and spoilage,
- it helps in easy handling, transportation and storage of products,
- it prevents the products from pilferage and adulteration, and
- attractive packaging invites you to pick a product and buy it.

17.8 ADVERTISEMENTS

You must have seen and heard about many advertisements on radio, TV, newspapers and magazines. What is the purpose of these advertisements? Yes, you are right. The purpose of an advertisement is to inform the consumers about the availability, use and special features of a particular brand of product. A good advertisement should give you correct information about a product and not mislead you. Some advertisements persuade you to buy things that you may not need. As a conscious and alert consumer, you should judge a product by actually examining it and not on basis of its advertisement alone.

INTEXT QUESTION 17.5

1. Following is a list of products, write the standardization mark (ISI/ AGMARK/FPO/Woolmark) usually found on each in the space provided

   (i) paint..... (ii) electric iron.....

   (iii) honey..... (iv) canned fruit juice.....

   (v) pure wool shawl..... (vi) ground spices.....

   (vii) pure ghee ..... (viii) LPG cylinders .....

   (ix) knitting wool..... (x) frozen peas .....

2. Fill in the blanks, with appropriate words.

   (i) Before buying a medicine its.....should be read carefully

   (ii) .....saves a product from breakage and spoilage

   (iii) An advertisement gives.....about a product.

(vi) Purchase of products with standardisation mark ensures that they are of a certain minimum .....

3. List any six items of information that should be mentioned on a label–

(i) ..... (iv) .....

(ii) ..... (v) .....

(iii) ..... (vi) .....

Activity: Collect one each of the following:

1. Advertisement from a newspaper/magazine for an electrical item.
2. A handbill advertisement on discount sales of garments/food item.

List the information given on these advertisements. Check whether they give all the information you need to make a purchase. Also check how many of them give correct information.

17.9 CONSUMER MOVEMENT

The numerous consumer problems mentioned earlier clearly bring out the need for you to be well informed and vigilant. This will enable you to make the best purchases and get the maximum value for your money. It will also discourage traders from using unfair and deceptive ways. However, you or the Government alone cannot protect all the consumers. Therefore, all consumers should fulfill their responsibilities and unite to protect themselves. A strong and active consumer movement is the most effective way of removing consumer problems. Consumer education helps people to develop a strong consumer movement.

> Consumer movement is a joint action of consumers against unfair practices of the traders and manufacturers.

Importance of Consumer Movement

In our country where a majority of consumers are ill-informed and ignorant, a strong consumer movement is required to exercise control over shopkeepers and manufacturers, so that the consumers are given a fair deal. By collective action, consumers can look after their welfare.

A consumer movement helps consumers to

- be aware of their rights and responsibilities and use them regularly,

- take action and report cases of wrong practices to concerned authorities. It helps consumer to seek redressal and get the guilty punished,
- share information regarding new products, consumer laws and schemes beneficial to them, and
- represent the consumer interests to the Government.

As a result of consumer movement, today, many motivated consumers have come together and formed groups to make their own unions, associations, societies, cooperatives, etc. Presently there are about 600 such organisations in India. To motivate and strengthen the consumer movement the Government has declared 15th of March as the **Consumer Rights Day**.

INTEXT QUESTIONS 17.6

1. Indicate whether the following statements are true or false by writing T or F against each statement. Justify your answer in the space given below.

   (i) It is not possible for all consumers to unite and form consumer groups for preventing traders from using unfair sales practices.

   .....

   .....

   (ii) A strong consumer movement increases consumer rights and decreases consumer responsibilities.

   .....

   .....

   (iii) Every year March 15th is celebrated as Consumer Rights Day.

   .....

   .....

   (iv) Consumers can help in developing a consumer movement that can look after the interests of the consumers in Government policies and programmes.

   .....

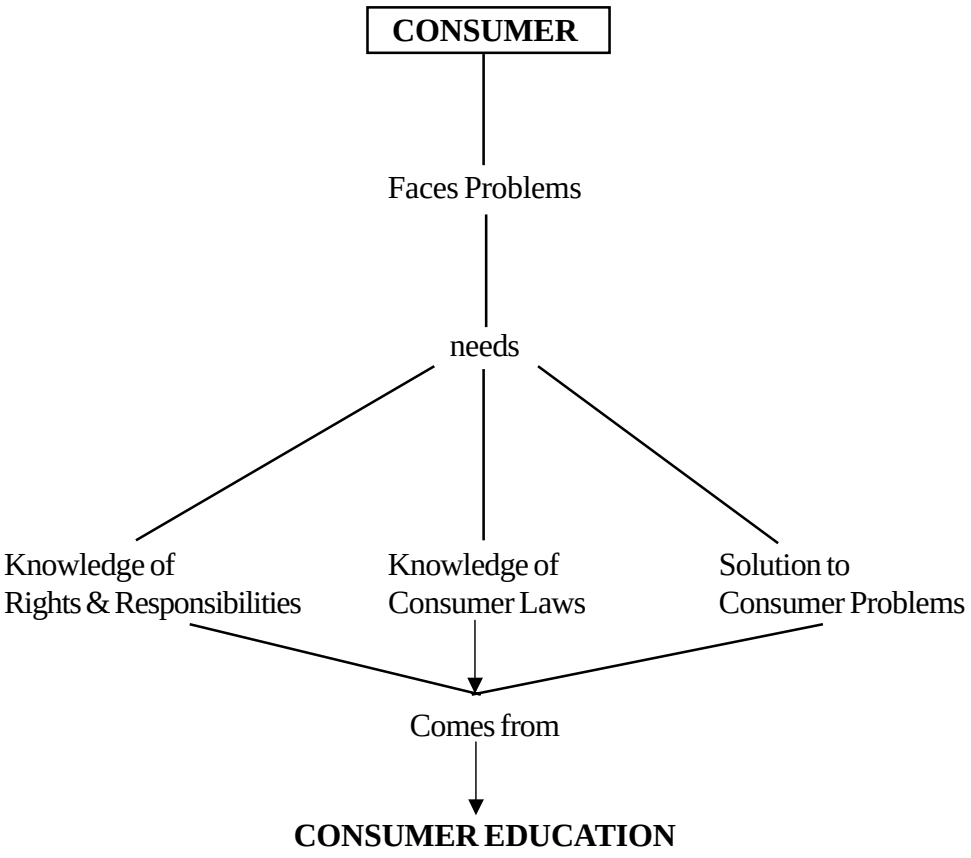
   .....

   (v) Some consumer unions assist consumers to take legal action against the guilty traders.

   .....

   .....

WHAT HAVE YOU LEARNT



TERMINAL EXERCISES

1. Define the following terms:

   (i) Consumer (ii) Consumer Education (iii) Consumer Movement

2. List the various problems faced by the consumers in the market today. Suggest solutions to any three problems.

3. Enumerate the consumer rights and discuss consumer responsibilities.

4. What is the importance of consumer protection laws? Describe the following laws: .

   (i) Essential Commodities Act

   (ii) Monopolies and Restrictive Trade Practices Act

   (iii) Consumer Protection Act and

   (iv) Standards of Weights and Measures Act.

5. Discuss the role of the following as consumer aids in assisting consumers in making wise purchases:

   (i) labels (ii) packaging (iii) advertisements

6. What is standardization? List the standardization marks available in the Indian market and describe them.

7. What do you understand by wise buying habits? Explain in detail in relation to the purchase of an electric iron.

ANSWERS TO INTEXT QUESTIONS

17.1 (i) F, (ii) T, (iii) F, (iv) T, (v) T

17.2 (i) maximum, (ii) adulteration, (iii) blackmarketing
(iv) deceptive, (v) information, (vi) standardization

17.3 1. (ii), (iii), (v), (vii), (x), (xii)

2. (i) bill / receipt / guarantee card /
   (ii) reported
   (iii) instructions

17.4 (i) c, (ii) f, (iii) g, (iv) a, (v) b, (vi) e

17.5 1. (i) ISI, (ii) ISI, (iii) AGMARK, (iv) FPO, (v) Wool mark
(vi) AGMARK, (vii) AGMARK, (viii) ISI, (ix) Wool mark,
(x) FPO

2. (i) label, (ii) packaging, (iii) information, (iv) standards

3. Refer Text.

17.6 1. (i) F, (ii) F, (iii) T, (iv) T and (v) T

AUDIO – Consumer Education – Rights and Responsibilities

For more information visit
Log on to www.consumeronline.org/guest/community/communitynews.asp

18

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GROWTH AND DEVELOPMENT (0-5 Yrs)

Development of a human being from a zygote to a full grown adult is a subject that has fascinated people over generations. Not only is this knowledge useful as a tool for understanding self, but also for guiding the growth of children. Some of you may be young parents with very young children and definitely most of you will become parents in the future. This knowledge of how children grow and develop from birth onwards will help you in understanding the developmental process of your children. It will also be helpful to you in recognising areas where the growth or development of a child is not normal or slower than it ought to be.

OBJECTIVES

After reading this lesson, you will be able to:

- list the stages of human life span;
- describe the patterns of growth and development and discuss factors affecting them;
- list the milestones of motor development during 0-5 yrs;
- highlight socio-emotional development;
- describe language development;
- trace cognitive development;
- discuss care of and behavioral problems in children.

18.1 STAGES IN THE LIFE SPAN

Human development can be better understood if we focus on its different

stages while relating to the whole. The human life span can be divided into the following stages:

Table 18.1 : Stages of life span

S.No.	*Stages of life*	*Age*
1.	Prenatal period	conception to birth
2.	Period of the neonate	birth to one month
3.	Infancy	1 month to 2 years
4.	Early childhood	2 to 6 years
5.	Middle childhood	6 to 11 years
6.	Adolescence	11/12 to 18/19 years
7.	Early Adulthood	18/19 to 40 years
8.	Middle age	40 to 60 years
9.	Old age	60 and above

If you look at the above table you will realise that of the stages listed here, the first one refers to development before birth and the next four can be clubed together to denote 'Childhood'. After childhood it is adolescence followed by adulthood which covers the next two stages i.e., 7 & 8. The last one left is old age. Hence basically there are four stages of development after the birth which are–

1. Childhood
2. Adolescence
3. Adulthood
4. Old age

18.2 PATTERNS OF DEVELOPMENT

Development essentially means change as a result of the complex interactions between many processes - biological, social and cognitive.

1. **Biological processes** involve changes that are physical in nature. Our genetic heritage, growth of body organs, acquisition of motor skills, hormonal changes at puberty, all reflect the role of biological processes in development.

2. **Cognitive processes** involve changes in the thinking, intelligence and language of the child. Perception, attention, understanding, problem solv-

ing, memorizing, imagination, all reflect the cognitive processes in children's development.

3. **Social processes** involve the changes in the child's relationship with other people, emotions and personality. The first smile of an infant, the development of attachment between the mother and child, children learning to share, to assert, to take turns, to play with others, all reflect the social processes in development.

You must remember that all these processes are intricately interwoven which means they constantly influence each other. The cognitive processes promote socio-emotional processes and the biological processes influence cognitive processes. For example, a sick child (biological process) is irritable and cries frequently (socio-emotional). If unable to attend school regularly, the child lags behind in studies (cognitive processes). Constant irritability also influences the relationship with others (social processes).

Activity 18.1: List five examples each of cognitive, social and biological processes. Try show the interrelationship in at least two of these situations.

S.No.	*Cognition*	*Social*	*Biological*	*Relationship*
1.				
2.				
3.				
4.				
5.				

INTEXT QUESTIONS 18.1

1. Match the stages and patterns of development in column I with their description given in column II.

I		II	
(i)	neonate	(a)	18/19 years-40 years
(ii)	adolescence	(b)	2-6 years
(iii)	early adulthood	(c)	increase in height

(iv) early childhood
(v) cognitive process
(vi) social process
(vii) Biological process

(d) making friends
(e) Birth - 1 Month
(f) watching a colourful mobile
(g) 11 - 12 years to 18 - 19 years
(h) expressing happiness
(i) increase in weight
(j) quarrel with peers.

2. Select the statements which refer to stages of development, from the statements given in question 1 and write them here.

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3. Select the statements which refer to patterns of development, from the statements given in question 1 and write them here.

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18.3 GROWTH AND DEVELOPMENT IN EARLY CHILDHOOD

Growth and development are complementary processes. Growth indicates the quantitative changes in the body, that is height and weight, while development refers to both the qualitative and quantitative changes, for example language acquisition. Development can be defined as a 'progressive series of orderly, coherent changes'.

Growth: Quantitative change Development: Quantitative and qualitative change

All development takes place according to certain principles some of which are as follows:

1. All growth and development follow an orderly sequence. A child can sit only when the muscles of the back are ready to support the body.
2. Each child normally passes through a number of stages, each with its own essential characteristics.
3. There are individual differences in development. Every child grows at his own pace. You know that children start walking by the time they are one year old but you may have also noticed that some are early and others are late.

Fig. 18.1(a) Sequential growth

4. Though the human being develops as a unified whole, each part of the body develops at different rates. Basically there are two sequences in the rate of development.

   (a) Cephalocaudal i.e. development proceeds from head to toe. The head and brain develops first, then the torso, the neck etc.

   (b) Proximodistal i.e. development proceeds from centre to extremeties. The child first gains control over the spine, then arms, then fingers.

Fig. 18.1(b) Sequential development

5. Development is essentially the result of the interaction between maturation and learning. While maturation is the 'unfolding of characteristics potentially present in the individual's genetic endowment', learning refers to the "relatively" enduring changes that come about as a result of experience and practise.

Genetic Endowment characteristics inherited from the parents by the off spring.

18.4 FACTORS AFFECTING GROWTH AND DEVELOPMENT

(i) Heredity - It is the process by which the features and characteristics are passed from parents to the child before the child is born. Thus fea-

tures like the colour of the skin and eyes, the height, body build, intellect and talents, etc., are all fixed and no one can change them beyond a limit.

(ii) Prenatal environment - This is the environment of the foetus in the womb. If the mother gets poor nutrition, is emotionally upset or smokes, drinks, or takes some medicine or suffers from certain diseases, the growth of the child can be adversely affected.

(iii) Nutrition - Proper nutrition is essential for the healthy development of the child. A malnourished child's growth may be retarded or slow.

(iv) Intelligence - Higher intelligence is associated with faster development while lower intelligence is associated with retardation in various aspects of development.

(v) Emotional climate of home - If there is a lot of discord/fights at home or the child is not given enough love and attention or there is physical/ mental abuse of the child, then the child's development is adversely affected.

(vi) Health of the child - If the child frequently falls sick, suffers from some disorder, is disabled or has disturbed endocrine functioning, the development is likely to suffer.

(vii) Level of stimulation - The amount of stimulation the environment provides to the child i.e., the opportunities for exploration of environment, opportunities of interaction with other people, etc., all influnence the rate of development.

(viii) Socio-economic status - It also influences the development by deciding the kind of nutrition, stimulation, facilities, opportunities, genetic endowment the child gets.

(ix) Sex - All children follow the same sequence of development. However, certain skills are faster in girls than in boys and some other skills are faster in boys than girls. For example, language acquisition is faster in girls and skills like jumping catching, throwing are faster in boys. Sex is also a factor that decides the potential of a child in physical development - boys grow up to be taller, heavier and more muscular than girls.

INTEXT QUESTIONS 18.2

Test your word power

Human Development is a new concept for you and you must have come across some new words. Given below are some of the words used in the text. Choose the option closest to the real meaning of the word. You can check the correct answer at the end of the lesson.

1. Body build: (a) building a collection of art (b) physical structure of a building (c) physique
2. Intellectual capacity: (a) making interesting conversation (b) the ability to think logically (c) smart
3. Genetic endowment: (a) wearing jeans (b) born with a particular feature interested from parents (c) to give generously
4. Endocrine functioning : (a) To attend an important function (b) to end a crime (c) working of hormone secreting glands
5. Prenatal environment: (a) environment of fetus in the womb (b) polluted environment (c) healthy environment
6. Emotional climate of home: (a) the atmosphere of happiness in the home (b) the atmosphere of fear in the home (c) the atmosphere of feelings in the home.

18.4 PHYSICAL DEVELOPMENT

Physical development includes (i) an increase in height and weight, (ii) changes in body proportion and (iii) development of teeth, bones and muscles.

(i) Increase in Height and Weight

A newborn baby weights about 2 to 3.5 kg at birth and loses about 150-200gms in just 3 to 4 days. After that the baby grows rapidly and doubles the weight by 6 months. The birth weight become 3 times by 1 year.

The length of the baby at birth is about 40 to 50cm and in one year it becomes 1 ½ times of the lenght at birth. Thereafter it increases as shown in the table below.

Table 18.2
Reference body weight and height of Children and Adolesents according to NCHS

Age (years)	BOYS		GIRLS	
	Height (cm)	Weight (kg)	Height (cm)	Weight (kg)
0	50.5	3.3	49.9	3.2
1/4 (3m)	61.1	6.0	60.2	5.4
1/2 (6m)	67.8	7.8	66.6	7.2
3/4 (9m)	72.3	9.2	71.1	8.6
1.0	76.1	10.2	75.0	9.5
1.5	82.4	11.5	80.9	10.8
2.0	85.6	12.3	84.5	11.8
3.0	94.9	14.6	93.9	14.1
4.0	102.9	16.7	101.6	16.0
5.0	109.9	18.7	108.4	17.7
6.0	116.1	20.7	114.6	19.5
7.0	121.7	22.9	120.6	21.8
8.0	127.0	25.3	126.4	24.8
9.0	132.2	28.1	132.2	28.5
10.0	137.5	31.4	138.3	32.5
11+	140	32.2	142	33.7
12+	147	37.0	148	38.7
13+	153	40.9	155	44.0
14+	160	47.0	159	48.0
15+	166	52.6	161	51.4
16+	171	58.0	162	53.0
17+	175	62.7	163	54.0
18+	177	65.0	164	54.4

(ii) Changes in Body Proportion

The head of the new-born is 1/4th the size of the body. As the child grows, the body becomes more proportionate as you can see from the illustration given below.

Fig. 18.1: Body Proportion

Milestones of physical development

A baby develops from the head to toes. The neck and shoulder muscles must be strong before she can sit, the trunk must be strong before she can stand. The time clock for development depends more on what is inherited than on environment but a baby who spends more time in pram will not learn to crawl as soon as a baby sitting on the floor surrounded by interesting-looking objects.

Fig. 18.2: Milestones of physical development

1. **Six weeks:** smiles at mother; eyes stare at a ring on a string and follow the mother.
2. **Three months :** turns head towards sound, head bobs down on mother's shoulder.
3. **Six months:** head steady and back straight when held on shoulder; sits with support of cushions; stretches arms to be lifted up.

As the newborn grows rapidly, control is first gained over muscles in the trunk and back, then in the arms and lastly in the extremities or the fingers.

(iii) Development of Teeth, Bones and Muscles

(i) Teeth: A normal healthy child first erupts the lower front teeth known as central incisor between 5-6 months, followed by upper incisor at 7 months. The next teeth to erupt are upper side-teeth (canines) in the 8th month followed by lower canines between 9th to 10th month. By the time a child is 3 years old he/she has 20 teeth. They are called milk teeth, because they are replaced by permanent teeth in middle childhood.

(ii) Bones and Muscles: When a child is born the bones are soft and contain more cartilage tissues. As the child grows, calcium gets deposited in the bones. The process of deposition of calcium in the bones is called ossification and is a continuous process. That is the reason, when children fall, they rarely fracture their bones. Children's bones are covered with fat and muscles. In the early years the fat deposit is more than the muscles. As they grow, it gets replaced by muscles.

18.5 MILESTONES OF MOTOR DEVELOPMENT

Age	*Motor Development*
0-2 months	Kicks aimlessly, stretches hand and feet, closed fist.
2-4 months	Follows a moving person with eyes, stares at a bright object, lifts chest short distance when placed on abdomen, holds head. Rolls from back to the side. Begins to grasp toy in hand.
4-6 months	Holds head steady when carried. Holds toys and reaches for objects. Raises hands to be lifted. Lifts head and shoulder and rolls over.
	Lifts self by hands or forearms when lying on the stomach. Sits up when propped.
6-8 months	Can hold head and sit erect without support. Bangs spoons or pats floors. Can pick up objects from floor, table. Can hold a toy in each hand. Has learnt to use the thumb to grip things.
8-10 months	Begins to crawl, can pull self up to stand by holding on to furniture.

	Holds small objects like buttons, coins between thumb and finger. Can hold, bite and chew objects.
10-12 months	Stands with slight support. Walk with support. Can push light objects. Picks up small and big objects and examines them.
1-2 years	Walks without support. Drinks from a cup. Can handle a spoon. Plays with push and pull toys. Can climbing stairs and come down as well. Scribbles. Eats by self.
2-3 years	Plays tirelessly. Can feed himself well. Bowel and bladder control is acquired. Can brush hair and teeth. Can take out and put back toys from cupboards. Follows simple instructions.
3-5 years	Can button and unbutton dress, can dress without help. Can attend to personal needs like toilet, washing. Ready for school.

18.6 SOCIO EMOTIONAL DEVELOPMENT

At birth a child is neither social nor unsocial but by 3 months he/she smiles and responds to friendly overtues. By 5-6 months the child can discriminate between a stranger and familiar person. Cooperates in simple games by 1 year and becomes shy in presence of strangers by 1 ½ years. Loves the company of same age persons by 2 years. The child starts throwing temper tantrums and resents the arrival of the new baby in the family. The fear of separation from the family members becomes significant. Loves to copy the action of his parents. Around 3 years of age, displays affection towards parents and starts cooperative play. Has imaginary friends, practices sex role activity. May enter pre-nursery. During 4-5 years of age, prefers to play with other children and becomes competitive.

18.7 LANGUAGE DEVELOPMENT

At birth a child cries to tell about his/her woes and needs. Slowly the crying becomes more peculiar and the mother can distinguish between hunger, discomfort and pain cries.

Around 3 months, the child starts cooing, i.e. makes happy gurgling sounds when pleased or picked. Around 6 to 7 months, cooing is converted to babbling sounds, which is a repetition of syllables like Ma - Ma, Ba - Ba, etc. By

nine months, a child can speak words. One word is used at a time to convey a whole sentence like 'doll' means 'I want a doll'. By one year, the child can combine two words. By 2 years 2 to 3 word sentences are spoken easily.

By the age of 5 years, a child has a vocabulary of about 500 words. This vocabulary then grows rapidly.

INTEXT QUESTIONS 18.3

1. Match the following motor and social skills in column A with the age the child learns these at, in column B. Some of these may be overlapping answer in column B.

Column A	Column B
(i) Walk without support	(a) 1-2 years
(ii) Sit up without support	(b) 3 years
(iii) Climb steps	(c) 2-3 years
(iv) Bladder control	(d) 5-6 months
(v) Stranger shyness	(e) 6 months
(vi) Cooperation in simple games	(f) 1 year
(vii) Cooperative play	(g) 8-10 months
(viii) Discrimination between strangers and familiar person	(h) 2 years
(ix) Use 2-3 word sentence	(i) 6-8 months
(x) Produces babbling sound	(k) 1½ years
(xi) Follows a moving person with eyes	(h) 2-4 months

2. Define motor development.

.....

.....

3. Name two types of motor development.

.....

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18.8 FEATURES OF COGNITIVE DEVELOPMENT

Some of the features of cognitive development seen in a child from birth upto five years are:

- Realises that the world exists even if he/she cannot see it (object permanence)
- Unable to see the perspective of others (egocentric)
- Unable to think logically
- Believes all things (living and non-living) to be possessing life and feelings
- Indulges in fantasy and make-belief play
- Easily confused by surface appearances
- Has uneven attention
- Has limited memory
- Confused about causal relationships
- Acquires basic concepts of colour, shape, size, number, days etc.
- Has high level of curiosity

18.9 HANDEDNESS

You all know that we prefer to use our right hand to do the majority of our daily chores. But some children prefer to use their left hand as their main hand. We should not force these children to change to the right hand because it may affect their brain and other developments. The child may also develop certain speech problems. This is because in the case of right handed persons, the center that controls handedness is on the left side of the brain and the main speech centre is on the right side of the brain. In case of left handed people, the system is reversed, i.e., the main centre of speech is on the left hand side and the handedness centre is on the right side of the brain.

When you force a child to change from left hand to right hand, the main speech centre on the left side tries to take up the function of handedness also. Hence the main speech centre gets over loaded and this affects both the functions of speech and handedness. This leads of speech problems accompanied by bad handwriting and other problems of coordination. Hence, let a left handed child remain left handed. Moreover, left handed children are as intelligent as right handed children.

INTEXT QUESTIONS 18.4

1. From the following list tick mark (√) those skills which are cognitive. Give reasons for your choice.

   i) thinks logically

ii) indulges in make belief
iii) follow moving object with eye
iv) confusion about causal relationship
v) recognizes colours
vi) able to eat with spoon
vii) curiosity
viii) easily confused by surface appearance
ix) brush own hair and teeth
x) limited memory span

18.10 TAKING CARE OF CHILDREN

A new born is helpless, delicate and tender and the mother needs to take special care so that the child grows up to be healthy and strong. Every child should get proper food, ample sleep and rest, regular bathing, suitable clothing and needs to be immunized against diseases.

1. **Feeding:** The first yellow secretion from the breast when the child is born is called colostrum. It has protective antibodies which provide immunity against certain diseases.

   Breast milk is easily and quickly digested. It has ideal composition and temperature. It provides emotional satisfaction to the mother and security to the child. Hence, all new-borns should be breastfed.

   Once the child is 3 to 4 months old, mother's milk is not sufficient to meet the nutritional needs. Hence the child has to be slowly weaned from milk to liquid to semi-solid to solid diet. This introduction of top feeding is called weaning. In the beginning fruit juice, clear soups of vegetables and dals are given, followed by mashed dals, fruits and vegetables, soups and kheers. One year old child can chew raw vegetables, chappatis, fruits, etc. However, weaning has to be done gradually.

2. **Rest and Sleep:** Rest is required for growth and development. It makes the child strong and healthy. The rest period varies from child to child, but on an average the sleeping pattern of children is as follows -

Age	*Hour of Sleep*
0-2 months	20 to 22 hours per day
2-6 months	16 to 18 hours per day

6-12 months	12 hours per day (and 1-2 hours afternoon/ morning nap)
1-2 years	12 hours at night and a nap in the afternoon.
2-5 years	8 to 10 hours including a nap in the after-noon.

(3) Bathing: All children should be bathed regularly to get into the habit of regular bathing, preferably at the same time each day. Before bathing, massaging should be done. Baby should be bathed with water at a temperature of about 85.0^0F. In summers, babies should be given a bath twice a day and in winters once a day or on alternate days.

Fig. 18.3: Bathing

(4) Suitable Clothing: A child's garments should be comfortable, soft, of absorbent material like cotton, simple in design, bright in colour, and easy to wash. They should not have too many frills, trimmings and buttons, draw-strings, and ribbons.

As children outgrow the size quickly, clothes should never be too many or too expensive.

Nappies or diapers are the most essential clothing for a baby, hence it should be soft, light weight, absorbent and quick drying.

Fig. 18.4: Suitable clothing

(5) Immunization: Right from birth all children should be immunized regularly against communicable diseases as it increases their body résistance.

Immunization Schedule
(againts vaccine preventable diseases)

FOR WHOM	WHAT	WHEN	WHY
Pregnant Women	T.T	Early in Pregnancy	Protects against Tetanus
		One month after the first shot	
Infants (Below 1 year)	BCG Bacillus Calmette-Guerin Vaccine	At birth	Protects against Tuberculosis
	Oral Polio Vaccine (0)		Protects against Polio
	BCG	At 6 weeks	Protects against Tuberculosis
	DPT-1		Protects against Diphtheria, Pertusis (whooping cough) and Tetanus
	Oral Polio Vaccine (1)		Protects against Polio
	DPT-2	At 10 weeks	Protects against Diphtheria, Pertusis (whooping cough) and Tetanus
	Oral Polio Vaccine (2)		Protects against Polio
	DPT-3	At 14 weeks	Protects against Diphtheria, Pertusis (whooping cough) and Tetanus
	Oral Polio Vaccine (3)		Protects against Polio
	Measles	At 9 months	Protects against Measles
	Chickenpox		Protects against Chickenpox
Children (Above 1 year)	MMR	At 15 months	Protects against Measles, Mumps and Rubella
	DPT Booster	At 16-24 months	Protects against Diphtheria, Pertusis (whooping cough) and Tetanus
	Oral Polio Vaccine Booster		Oral Polio Vaccine
	DT	At 5-6 years	Protects against Diphtheria and Tetanus
	TT	At 10 years	Protects against Tetanus
	TT	At 16 years	Protects against Tetanus

18.11 BEHAVIORAL PROBLEMS IN CHILDREN

Young children often demonstrate behaviours which are inappropriate. For example, a child may be in a habit of hitting everybody else, breaking things, abusing/telling lies, etc. These are behaviours which not only harm children physically but also make them unpopular with other children.

Causes: There can be many reasons why children develop these behaviours. Some are listed here:

- When children live in an environment which forbids any self-expression they pick up behaviours which are unacceptable.
- When parents and teachers expect too much from children and they are not able to keep upto expectations, they show unacceptable behaviour.

Fig. 18.5

- Often children learn that unacceptable behaviours are tools to get what they want. For example, the child learns that when he hits his younger siblings parents attend to him or when he cries and rolls on the floor he gets the toy he wants.
- When family environment is disturbed, children start showing unacceptable behaviour, eg., when parents quarrel with each other, they hit each other or when their mothers and grandmothers do not get along with each other.
- When there is a crisis in the child's life. Children show unacceptable behaviours on birth of another sibling, the death of a beloved member of the family.
- Children may also develop unacceptable behaviours because physically they are not able to cope up. This happens when they have had a long illness or when they fall sick too frequently.

The caregivers at the playcentre have to be alert and understanding. whenever there is a child who shows unacceptable behaviour they must act immediately. Since, very often the cause of the behaviour originates from home they must ask for cooperation of the parents, understand the problem and develop a strategy which helps to cure the problem. Punishing and scolding or ridiculing will not help. Some of the common problem behaviours are described in the following table together with a description of what adults normally do but they should not do and what they should do.

Common Behaviour Problems Observed Among Young Children

Behaviour	*Meaning*	*Do not*	*Do*
(a) Hurts other children	- Angary, feeling troubled	- Punish or hurt - Make the child feel bad	- Divert attention - Separate other children quietly - Help the child feel loved by giving other outlets for feelings.

(b)	Destroys things	- Feeling of helplessness - Jealousy - Boredom - Seeking attention	- Scold, shout, punish, spank or hit	- Keep precious things out of reach - Provide place for play - Offer low-cost substitutes - Divert and involve the child in other activities
(c)	Sucks the thumb	- Need for sucking, love, comfort and assurance - Tiredness - Hunger - Dissatisfaction - Boredom	- Punish or scold - tie fingers or smear them with bitter medicine	- Provide sucking satisfication - Offer love affection and assurance - Involve in pleasurable and interesting activity - Provide things needed for the child
(d)	Wets the bed	- The child is not ready for training - Fear - Insecurity	- Threaten or punish - Insist on prior information - Tell you do not love the child	- Accept the child as he/she is - Expect accidental bed-wetting - Help and encourage the child to become confident
(e)	Tells lies	- Fear of punishment - Exaggeration - Imagination - Attention seeking	- Preach or punish or reject - Make him apologize - Get upset	- Understand the reason - Give the needed attention - Provide opportunity for enriching the imagination - Tell the truth

(f)	Refuses to eat	- Is not hungry - Feels unwell - Dislikes particular food - Forced to do the act	- Force or punish - Make a scene - Reward, threaten	- Be calm - Introduce new foods along with the favourite
(g)	Fears	- Reviews painful experience - Needs parent's closeness - Feels guilty or unloved	- Force, seek reason for fear, shame or threaten	- Reassure and comfort - Make the environment a happy one. - Encourage efforts. - Avoid fearful experiences
(h)	Steals	- Ignorance of property rights - Unsatisfied needs - Irritation - Hostile feelings	- Scold, make feel bad, punish or reject - Cut off love - Humiliate before others	- Let the child own things and get a sense of ownership - Be kind, under-standing and not too strict. - Provide creative outlets - Help make real friends

INTEXT QUESTIONS 18.5

1. Choose the correct answer. Justify your answer.
   (i) Children develop unacceptable behaviours if the environment is
   (a) forbidding
   (b) free
   (c) forbidding and free
   (d) none of the above

   Justification_____

(ii) A child sucks her thumb because she is:

(a) bored
(b) insecure
(c) scared
(d) asking for attention

Justification_____
_____
_____
_____

(iii) A child wets the bed because she is :

(a) bored
(b) insecure
(c) sacred
(d) asking for attention

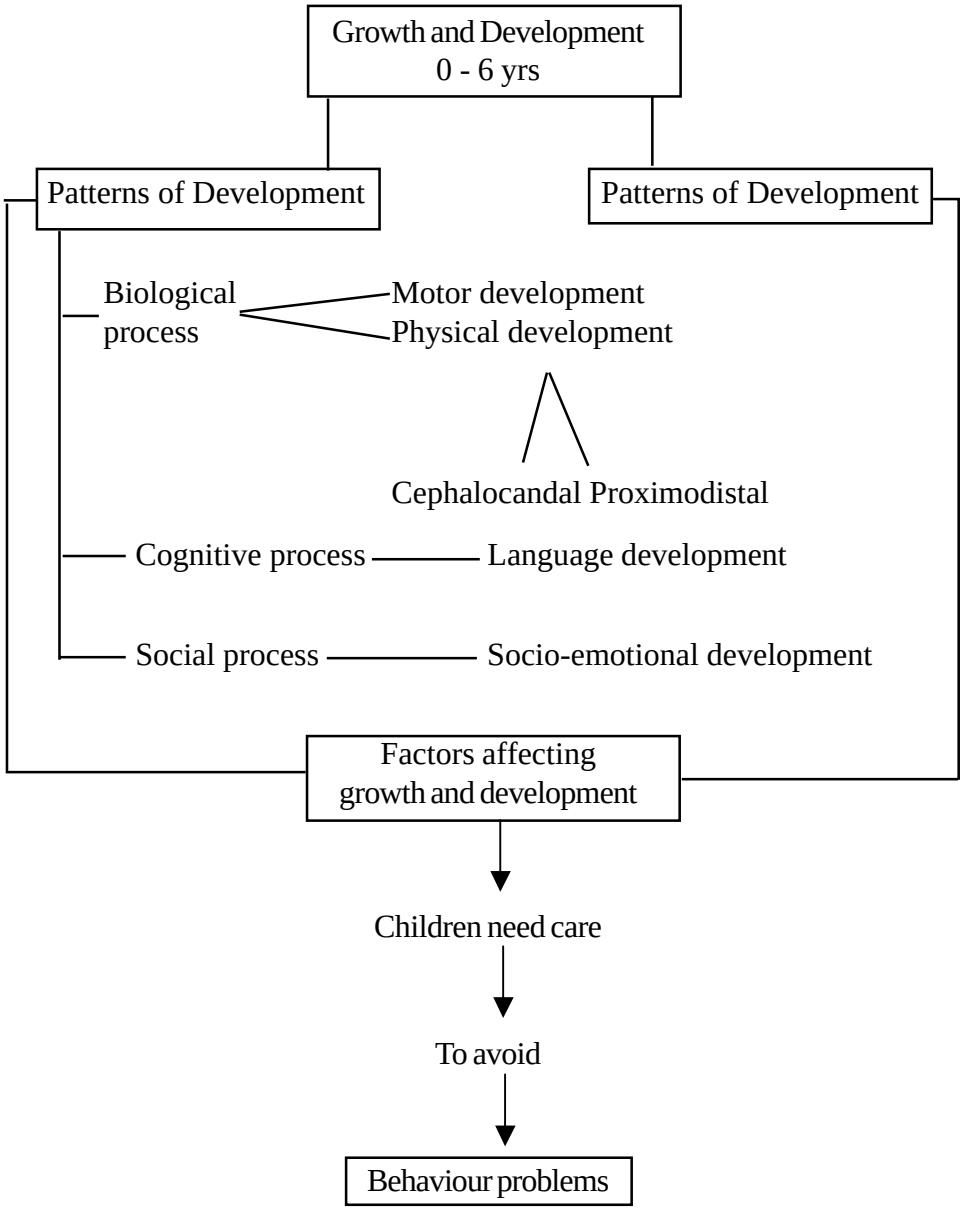
Justification_____
_____
_____
_____

(iv) A child tells lies because she is :

(a) bored
(b) insecure
(c) jealous
(d) asking for attention

Justification_____
_____
_____
_____

WHAT YOU HAVE LEARNT



18.4 TERMINAL EXERCISE

1. List milestones of motor development.
2. Describe the cognitive characteristics of a 4- year old child.
3. Why are some people left handed? What happens if they are forced to become right handed?

4. What points should be considered while selecting clothes for children?
5. Give the latest immunization schedule for children.
6. Define behaviour problems. Give the causes and methods to control any five of them.

ANSWERS TO INTEXT QUESTIONS

18.1 1. i/e, ii/g, iii/c, iv/b, v/f, vi/d, vii/a.

2. Stages of development - i) neonate ii) adolescence iii) early adulthood

3. Patterns of development iv) early childhood v) cognitive process vi) social process vii) biological

18.2 Test your word power

1/c, 2/b, 3/b, 4/c, 5/a, 6/c

18.3 (i) (a) (ii) j (iii) a (iv) a (v) b (vi) k (vii) f (viii) b (ix) d (x) h (xi) g (xii) l

18.4 (iii), (iv), (vii), (x)

18.5 1. i) a) - a child living in an environment which for bids any self- expression develops unacceptable behaviour

ii) a) - a child who is bored will often such thumb.

iii) b) c) a child who is insecure and scared may wet the bed

iv) d) a child asking for attention may till lies.

AUDIO - Jeevan ka Prarambh

VIDEO - (1) Human Reproduction (2) How to organize a play centre (3) Play time is fun time (4) Little people on the move.

For more information log on to
http:// www.pey.pdse.eclu/Psicafe/Areas/Development/PhysDev-Child/
www.successbycoglynn.org/childDev.html

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19

GROWTH AND DEVELOPMENT (6-11 Yrs)

You have studied earlier that development from birth to old age is a continuous process and is divided into four stages-childhood, adolescence, adult hood and old age. You have also studied about the special features of growth and development that takes place in early years called 'early childhood'. In this lesson, you will became familiar with growth and development during middle childhood, which you know is from 6-11 years of age.

OBJECTIVES

After reading this lesson, you will be able to:

- describe physical development in middle childhood;
- identify the landmarks of motor development during this period;
- relate the socio-emotional development that takes place in middle childhood to the behaviour of the child;
- elaborate the language development during middle childhood;
- trace the cognitive development during this period.

19.1 PHYSICAL DEVELOPMENT

You may have noticed that boys and girls gain height suddenly but at different ages. From about 2 ½ to 3 years to 10 years, children (both boys and girls) gain about 5-7cms in height and about 2-3kg weight every year. Have you noticed in your neighbourhood that many of the girls who were shorter than the boys till they were about 9-10 years of age suddenly become taller

than the boys? This happens because the girls start their growth spurt earlier than the boys and reach the maximum earlier.

The sudden increase in height and weight in the 11-13 years age group is called growth spurt.

REFERENCE BODY WEIGHTS AND HEIGHTS OF CHILDREN AND ADOLESENTS ACCORDING TO NCHS

Age (years)	BOYS		GIRLS	
	Height (cm)	Weight (kg)	Height (cm)	Weight (kg)
0	50.5	3.3	49.9	3.2
1/4(3m)	61.1	6.0	60.2	5.4
½(6m)	67.8	7.8	66.6	7.2
¾(9m)	72.3	9.2	71.1	8.6
1.0	76.1	10.2	75.0	9.5
1.5	82.4	11.5	80.9	10.8
2.0	85.6	12.3	84.5	11.8
3.0	94.9	14.6	93.9	14.1
4.0	102.9	16.7	101.6	16.0
5.0	109.9	18.7	108.4	17.7
6.0	116.1	20.7	114.6	19.5
7.0	121.7	22.9	120.6	21.8
8.0	127.0	22.9	120.6	21.8
9.0	132.2	28.1	132.2	28.5
10.0	137.5	31.4	138.3	32.5
11+	140	32.2	142	33.7
12+	147	37.0	148	38.7
13+	153	40.9	155	44.0
14+	160	47.0	159	48.0
15+	166	52.6	161	51.4
16+	171	58.0	162	53.0
17+	175	62.7	163	54.0
18+	177	65.0	164	54.4

19.1.1 Change in Body Proportions

As you already know the head of the newborn is 1/4th the size of the body and that of a 6-8 year old is about 1/6th of the body and by adulthood it will become 1/8th of the body. In other words, the head becomes smaller in proportion to the rest of the body as one grows.

In middle childhood along with gross muscles, fine muscles develop rapidly.

Fig. 19.1: Change in Body Proportions

19.1.2 Development of Teeth, Bones and Muscles

i) Teeth

If you remember, by the time a child is 3 years old, the child has 20 teeth and these are the milk teeth. But by the time the child is in middle childhood, he/she has 28 teeth and these are all permanent teeth. An adult has 32 teeth.

Fig. 19.2: Development of teeth

ii) Bones

By middle childhood, all the bones in the body are formed and hence-forth, these continue to grow in size and strength. Bones become brittle when there is too much calcium in them and they break easily. During middle childhood, there is sufficient calcium in the bones to make them strong. This is one reason why the activity level in middle childhood is high. Strong bones provide better anchorage to the muscles.

iii) Muscles and Fat

All bones are covered with fat and muscles. Girls have more fat around their bones than muscles. At seven to eight years, girls start to gain more fat than muscles on their arms, legs and trunk, whereas boys have more of muscles than fat. This is why they have more strength. Boys can gener-ally run longer distances, jump higher, etc.

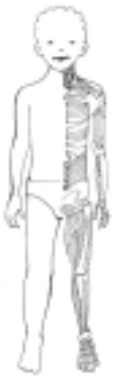


Fig. 19.3: Development of bones and muscles

INTEXT QUESTIONS 19.1

1. Tick mark the most appropriate answer.

   i) By middle childhood, the number of teeth in a child's mouth are

      a) 20
      b) 24
      c) 28
      d) 32

   ii) Head to body proportion during middle childhood is

      a) 1/8
      b) 1/6
      c) 1/4
      d) 1/2

   iii) All the bones of the body are formed by :

      a) infancy
      b) early childhood
      c) middle childhood
      d) adolescence

   iv) Boys are stronger because they have more:

      a) bones
      b) muscles
      c) fat
      d) calcium

19.2 MOTOR DEVELOPMENT

Have you seen 6-11 year old coming out of their classes after school is over? What would they be doing ? Yes, you are right ! Some of them would be running, others would be skipping and still others leaping onto narrow edges and balancing themselves. In all these activities, the children are learning to co-ordinate their muscles for different types of movements.

The body has two types of muscles, namely, the **large muscles** such as those of the arms, legs, back, etc., and the **small or fine muscles** such as those in the fingers, toes, etc. You probably know that muscular activity is possible because of their contraction and flexion (relaxation). Different muscles placed in different parts and some in same parts of the body perform and control different movements. Some part of this control is automatic while some part

is learnt. Movement due to muscular control which is learnt is called **muscular co-ordination**.

Muscular co-ordination is of two types : **fine** and **gross**. The movement of the fine (small) muscles is called **fine muscular coordination** while the movement of large muscles is called **gross muscular coordination**. Activities such as running, balancing, skipping climbing, involve mostly the coordination of large muscles.

Fig. 19.4: Gross musclar coordination

Let us make the following observation. There is a pencil lying on a table- How will a one year old child pick it up? How will a 3 year old and and 11 year old pick it up? How will you pick it up?

You will observe that the one year old uses her entire palm to pick the pencil while the three year old may use more than one finger and thumb to pick the pencil. At the same time, the eleven year old may use the index finger and thumb and may also be able to manipulate the pencil with very fine movements, i.e., play with it using only the index finger and the thumb or twirl it around or apply just the right pressure for writing.

Fig. 19.5: Fine muscular coordination

What type of muscles do the fingers have? Large or small? Obviously, the small ones. Through this example, you can see that the younger child uses gross muscular coordination for picking a pencil while an older child uses finer muscular coordination for the same task. As the child grows older greater proficiency over fine movements is gained. This is the period when many activities which involve fine muscle coordination can be taught to the child such as writing, needlework, painting, etc.,

Can you suggest some more activities of this type?

You already know from experience that children learn to walk, run, jump, kick, before they learn to feed themselves or write. What does this tell you ?

This tells you that ***gross muscular coordination* is *learnt before fine muscular coordination.***

Sensitive Period

Think what will happen if we insist on making a child learn an activity before the muscles are ready for it ? Yes, the muscles which are not yet completely formed will get damaged. Which muscles stand greater chance of being damaged? Yes, the fine muscles. This is the reason why children should not be forced to write before they are four and a half to five and a half years old. You will now realize that formal studies in schools start only in class I, when the child is 5-6 years of age and the fine muscular coordination for writing is almost complete. From 6-11 years, the handwriting gradually improves i.e., it becomes better and faster.

Sensitive period is the time when one can learn a specific activity most effectively.

Around the sensitive period, the body is ready to learn a particular activity or skill most efficiently. If the child is given practice and encouragement at this time to learn that activity or skill, the child will learn it best. Children in the age group of 6-11 years learn maximum number of different activities. They play different types of games. What does this information indicate ? That many of the muscles are maturing at this stage.

The following chart shows the motor development or certain activities and skills from 6 years to 10 years.

AGE	RUN, KICK THROW BALL	BALANCE	SKIP, HOP AND JUMP
	Fig. 19.6 Catching	**Fig. 19.7 Balancing**	**Fig. 19.8 Jumping**
6 yrs.	Can throw a ball	Can balance on one foot for very short while	Can skip with two legs.
7 yrs.	Can throw a ball at an estimated distance	Can balance on one foot for short while.	Can hop and jump in small squares
8 yrs.	Can throw a small ball at an estimated distance	Can balance on one foot for a short time.	Can skip and play games with alternate hopping rhythm.
9 yrs.	Can throw a small to even larger distances, runs with coordinated movements	Can balance and hop on one foot for long periods.	Jump as high as oneself.
10 yrs.	Can judge and stop a small ball	Can balance and hop on one foot for long periods	Can run and jump hurdles at same time

INTEXT QUESTIONS 19.2

1. Carefully read the list of activities given in column A. Rearrange them in column B as a child learns them age-wise. Mention the age in column C.

	Column A	Column B	Column C
i)	Hops and jumps in small squares	.....	.....
ii)	Skips with both legs	.....	.....
iii)	Runs and jumps hurdles	.....	.....
iv)	Jumps as high as oneself	.....	.....

2. These activities are performed by you everyday. Seperate the fine muscular co-ordination from the gross muscular co-ordination.

i) Sharpening a pencil .....
ii) Walking on the road .....
iii) Eating food with spoon .....
iv) Climbing stairs .....
v) Running and jumping hurdles .....
vi) Tacking a button on the shirt. .....

19.3 LANGUAGE DEVELOPMENT

Let us now see what happens to language in the middle childhood. Have you conversed with an eight year old child ? You will be surprised to see how much the child knows and can explain. By middle childhood (6-11 years) a child's basic command over language is complete. The child has a vocabulary of about 14,000 to 30,000 words. The ability to use language well and to communicate well develops at this age. By now, the child also understands that one word can have more than one meaning. Children like to crack jokes where the same word or similar words have the same or similar meanings.

Children of six years to eleven years begin to understand the formation of sentences better. Not only do they know that the same word can have different meanings they also know that words with the same pronunciation can have different spellings and thus different meaning. For example, CORN can mean the cereal or the hard, painful growth on the skin. HERE and HEAR or WHOLE and HOLE have not only different meanings but also different spellings. They enjoy using metaphors and tongue twisters.

Some **metaphors** are:

- bright as the sun
- look before you leap
- light as a feather
- between the devil and the deep sea

Some **tongue twisters** are

- She sells sea shells on the sea shore.
- Betty Boughter bought some butter but the butter was too bitter so she bought some better butter to make the bitter butter better.
- How much wood could a wood-chuck chuck, if a wood-chuck could chuck wood.

Besides the metaphors and tongue twisters that the children enjoy, they also develop a sense of **humour.** Much of the children's humour at this age is centered around the subtle meaning of language. Children love jokes which may appear rather silly to adults.

For example:

Fig. 19.9 : Humour in children's conversation

19.4 SOCIO EMOTIONAL DEVELOPMENT

Let us first understand the meaning of social development:

> **"Social development involves not only learning to behave in a socially approved manner but also developing the ability to get along with others."**

And, what is emotional development?

> **"Emotional development means gaining control over one's emotions and learning to express them in socially approved ways."**

The common thing that emerges from both the definitions is "learning to behave in socially approved ways." By middle childhood all major emotions are present in the child. Between 6-11 years of age children learn to gain more control over emotions. They learn to select and express emotions in more *socially approved* ways. Emotional development occurs simultaneously and almost as a part of social development. Hence, we refer to it as *socio emotional development* of children.

You know that social development refers to a child's ability to adjust to the social surroundings i.e., home, playmates, school, etc. This means that certain people like parents, playmates of the same age group, teachers at school, influence the social development. In the following sections we shall learn about how they actually influence the social development.

i) Parents

Middle childhood is the stage where children develop self confidence and acquire ***self-esteem.*** Confident parents provide better opportunity to children to be confident. Parents who accept their children "as they are" and love them, help the child to develop ***self-confidence.*** Such parents lay down clear rules for the children. They praise their children for the good things they do and usually do not punish them for their wrong doings. If the child does anything wrong, they try to explain why it is wrong. In other words, they adopt a ***democratic*** method of ***disciplining*** the children.

ii) Peer Group

Peer group refers to the playmates of the same age group. Peer group plays an important role in helping fellow mates develop socio-emotional skills. For example, children come to know from each other that all parents have high expectations from their children. If one child falters, she knows that others also do/can falter. In other words, peer group offers a platform for children to compare.

From the peer group, children also come to know that all parents guide, dictate and scold. They learn that no child gets a free hand in doing whatever she/he wishes to do. This may make an individual child very angry and rebellious but by talking to the peer group, she realizes that she is not only one who feels like this. All children get angry with their parents but the peer group helps the children to cope effectively with this anger and not become rebellious against parents. Thus, peer group provides comfort and emotional security that adults cannot. Children learn from their peers to keep parents happy and thus, master the skill of getting along in society.

Peer group also teaches children to become independent. The following is a typical example of a conversation between two ten year olds.

HAVE YOU EVER STAYED AWAY FROM YOUR MOTHER AT NIGHT?
YES
HOW DOES IT FEEL?
ITS ALL RIGHT FOR ONE NIGHT BUT AFTER
THAT ITS TOUGH
YES EXACTLY

Fig. 19.10

Rahul was scared to spend a night away from his mother but when he realized that it was quite normal to feel scared (as other children did too) and yet possible to spend a night away from his mother, he was able to do so.

In short, we can say that peer group:

- helps to see how one compares with others of same age;
- provides emotional security and comfort that an adult cannot;
- helps the child learn how to get along in society;
- helps children to become independent of their parents.

Activity 19.1 Give the meaning of the following similar sounding words. You may consult a dictionary to get correct meanings.

Word	**Meaning**
Corn	Cereal
Corn	painful growth on skin
Weak	
Week	
Principle	
Principal	
Beer	
Bear	

iii) School

School also plays an important role in the socio-emotional development of children. Teachers encourage students to do well. When they praise the children for things done well and scold them for bad/poor performance, they are helping children to develop.

For example, everyone can not be good at sports or at drawing or at needle work. Every child cannot stand first in class. But every child is good at doing something or the other. Teachers praise and encourage children to do better in whatever task they are good at. Remember, self confidence is essential for learning skills needed to become a useful adult.

INTEXT QUESTIONS 19.3

State whether the following statements are true or false. Give justification for your answer.

i) Children between 6-11 years get confused between words which are pronounced the same way but have different meanings.

Justification.....

.....

ii) Children of middle childhood find it difficult to speak tongue twisters.

Justification.....

.....

iii) Confident parents have confident children.

Justification.....

.....

iv) Democratic method of disciplining hinders development of self confidence in children.

Justification.....

.....

v) Peer group provides emotional security and comfort.

Justification.....

.....

vi) Peer group makes children dependent on their parents.

Justification.....

.....

19.5 COGNITIVE DEVELOPMENT

Cognitive development refers to the way a child thinks, reasons and solves problems.

You have already learnt that in early childhood, i.e., between 2 and 7 years of age, cognitive development has taken place in the following areas:

- object permanence
- belief that non-living things have human qualities
- inability to understand another's view point.

The period 6-11 years is a major turning point in cognitive development. Now the child learns to think in a more logical way. Some of the other major cognitive developments are:

i) Differentiation between fantasy and reality

For a young child, there is no difference between fantasy and reality. For a four year old, Santa Claus is real whereas a ten year old will immediately say that Santa Claus is imaginary. A small child believes that babies can be bought from a hospital whereas an older child will tell you that babies can not be bought at a hospital. We are sure you can quote many more examples of this kind.

ii) Understanding another's point of view

Let us take an example. Rohan's mother is in the kitchen and asks him a question. Five year old Rohan who is playing in another room, nods in answer to the question. At that age Rohan thought that his mother could see him nod. At a slightly older age, say, at eight years, Rohan will be able to place himself in his mother's shoes and realize that his mother can not see him nod. In other words, he will be able to understand another persons view point or EMPATHIZE with others. The inability to empathize with others is called EGOCENTRISM. This ability to empatlize starts developing in middle childhood and improves as the child approaches the end of middle childhood.

iii) Reversibility

Let us do the following activity.

Show a mud ball to a four year old child. Make a bed out of it. Show it to the child. Now transform this bed into a snake. Now ask the child to make a bed out of it again. The child shows his inability.

This happens because he/she is not able to think backwards clearly through the various steps. By middle childhood this ability starts developing and by eleven years, the child will be able to trace with expertise all the steps backwards. This ability to think and follow the steps backwards is called reversibility.

iv) Belief that physical properties do not change: Conservation

Let us do another activity. Arrange ten coins in two lines. In one line coins are nearer to each other while in another line coins are further away from each other. Ask a four year old child, 'which line has more coins?' The child says, the line which is longer has more coins. But an eight year old will immediately know the difference and give the correct answer. This is because she understands that physical properties of objects remain the same-ten coins will remain ten coins, whether arranged nearer or away from each other.

Let us do a small experiment on physical properties of objects and how children understand them. Invite a four-five year old and a nine-ten year old for a cold drink. Take two bottles of cold drinks. Take two glasses-one of them should be tall and narrow and the other should be short and wide. When you pour the same amount of cold drink to the two glasses, what will happen? Yes, of course. The level of cold drink in the taller glass will be higher and lower in the wider glass. Remember to pour the cold drink in front of the children. Now ask them to pick up a glass each. You will notice that the younger child will definitely choose the tall glass even if she has to fight for it. This is because the younger child thinks that the tall glass has more. The older child understands that the volume of drink is same in both the glasses, irrespective of the shape of the glass.

This ability to understand that certain physical characteristics of objects remain the same even when they appear to be outwardly different is called CONSERVATION.

v) Classification

You must have seen a set of playing cards. How many different ways can you classify them in? If you ask this question to a four year old, the child will insist that they can be arranged in only one way-probably by colour. But a nine-ten year old will be able to *arrange* i.e., CLASSIFY them in many different ways. So we see that in middle childhood, children realize that objects can be classified in many different ways.

vi) Seriation

Ask a five year old and a ten year old child this simple riddle. There are three sisters-A, B and C, A is taller than B and B is taller than C. Is A taller or shorter than C? The five year old will not be able to answer but the ten year old will be able to answer correctly and also explain how she reached the conclusion. This is because she can mentally arrange in ascending/descending order, i.e., A>B,and B>C, therefore A>C or C<A.

This ability to arrange items is called SERIATION.

vii) Time and speed

A ten to eleven year old child has the concept of time and speed. She can read the time from a clock or a watch. She understands the concepts like early, late, quick, slow, now or later, etc. Similarly, she understands about speed and can tell you that a car travelling at 60 km/hr will reach earlier than the one traveling at 40 km/hr.

Can you now summarize the characteristics of cognitive development in middle childhood ? Look at the following table.

Characteristics of cognitive development in middle childhood:

1. Concept of fantasy and reality
2. Empathy, Egocentrism
3. Reversibility
4. Conservation
5. Classification
6. Seriation
7. Concept of time and speed

Like other developments, cognitive development depends upon heredity and environment. A person is born with a certain amount of intelligence. But whether the person will be able to use all this intelligence depends upon how these inborn capabilities are developed. If a child has never seen a written word how will she know what written words mean? If a child has never had an opportunity to arrange objects in order, how will she learn seriation ? An exposure to enriched environment and many different activities helps the child to develop her faculties to the maximum and use them as and when required. Allow each child to grow up in a rich and stimulating environment.

Remember that all developments are inter-related. If the child is healthy, he/she has energy to work and learn. He/she is happy with his/her progress and gets along well with his/her playmates. Poor health means lack of energy, irritation and frustrations all the time and thus, fewer friends.

INTEXT QUESTIONS 19.4

I. Using the following clues unscramble the given letters to find out the various areas of cognitive develoment being exhibited.

i) Seema arranged all the water bottles height wise.

(SRAINOTIE) .....

ii) Shankar is trying arrange six marbles in different shapes.

(NIARSOCNEVTO) .....

iii) Radhika replies loudly to tell her mother that she does not want to watch T.V just now.

(YAPHTME).....

II.

1. When a child is able to arrange A,B and C in ascending order he/she is:

(a) 3 year old (b) 5 year old

(c) 6 year old (d) 10 year old.

2. When a child is able to say that a car moving at 50 miles/hour speed will reach its destination before the one moving at 40 miles/hour he/she is:

(a) 3 years old (b) 5 years old

(c) 6 years old (d) 10 years old

3. A 9 year old child can arrange leaves from plants in

(a) one way (b) two different ways

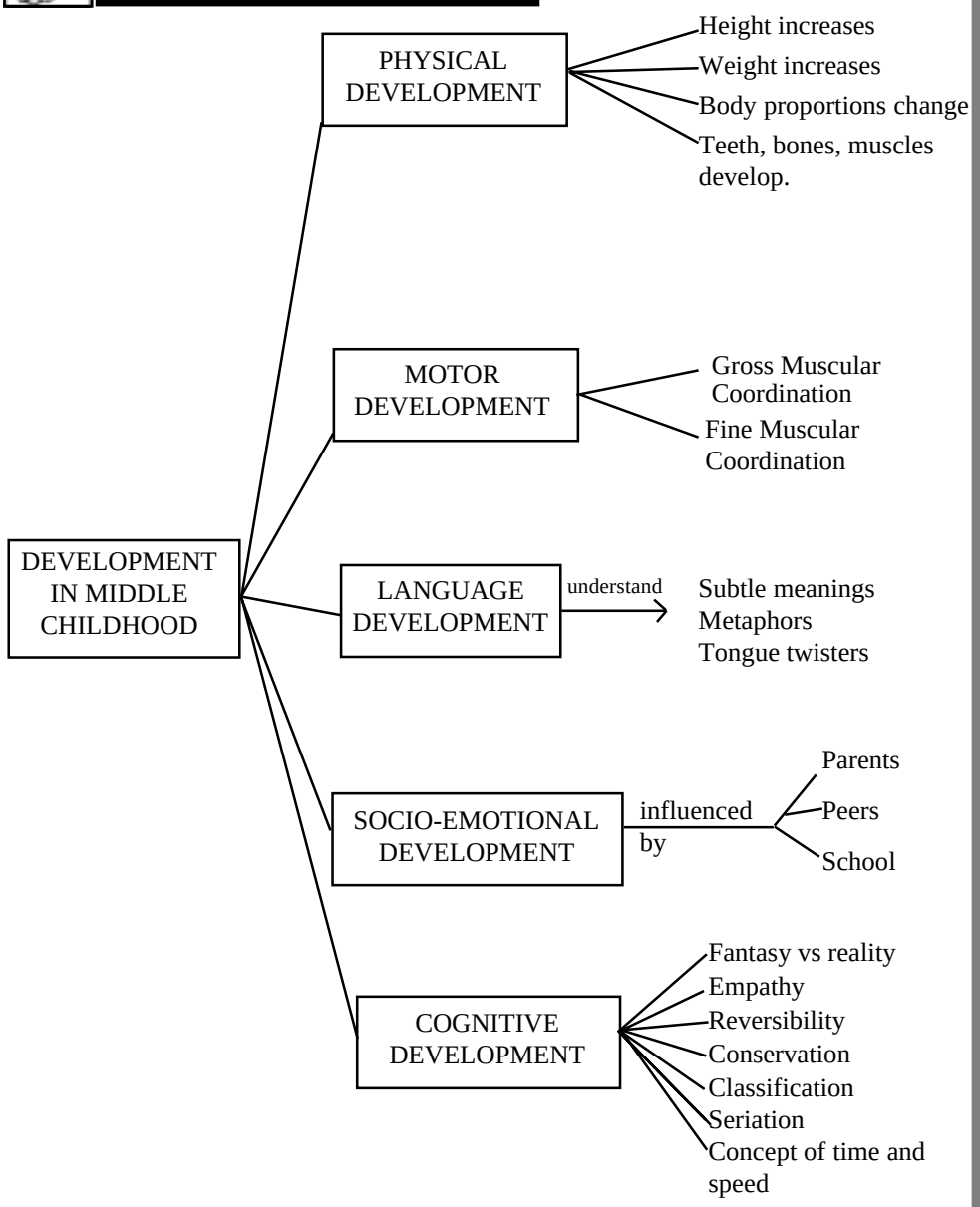
(c) ten different ways (d) many different ways.

4. Differentiation between fantasy and reality comes to a child when he/she is

(a) 3 years old (b) 5 years old

(c) between 3-5 years of age (d) between 6-11 years of age

WHAT YOU HAVE LEARNT



TERMINAL EXERCISE

1. Describe how the physical and motor development in middle childhood is different from early childhood.
2. Give examples to show how the socio-emotional development of an 8 year old child is different from a 4 year old.

3. Give the details of language development of a 10 year old child.

4. What are the cognitive characteristics of a 11 year old child?

ANSWERS TO INTEXT QUESTIONS

19.1 1. i) (c) ii) (b) iii) (c)
iv) (b)

19.2 I. i) 7 yrs, ii) 6 yrs, iii) 10 yrs iv) 9 yrs

II. Fine muscular coordination - i, iii, vi

Gross muscular coordination - ii, iv, v

19.3 i) False. 6-11 year olds can not only differentiate between such words but also enjoy using them.

ii) False. 6-11 year olds enjoy speaking tongue twisters.

iii) True. Confident parents bring up children democratically which helps in giving confidence to children

iv) False. It encourges self confidence in children

v) True. They know that others also feel the same way on many similar issues

vi) False. They learn from each others experiences and gradually learn to be independent.

19.4 I i) seriation ii) Conservation iii) Empathy

II i) (a) ii) (d) iii) (c) iv) (c)

VIDEO – Cognitive Development During Middle childhood.

20

321en20

ADOLESCENCE

*"Y*ou are not a child anymore, let the younger ones play, you come and help me.

"There is no need for you to sit here amongst-adults, go out and play."

Do you remember the time when these kind of remarks were made at you? Yes, you are right, we are talking about the time when you were not considered a child and yet were not even a part of the adult world. This period between childhood and adulthood is called **adolescence**. WHO defined adolescents as people within the age group of 10-19 years. What happens during this period that makes you belong nowhere? What are some of the special characteristics of this stage? What are the strengths and weaknesses of this period ? In this lesson, we are going to talk about adolescence and all the changes that take place during this period.

OBJECTIVES

After reading this lesson you will be able to do the following:

- define the term "Adolescence";
- describe the physical changes occuring in both the sexes during adolescence;
- discuss the consequences of sexual maturation on the self-confidence of adolescents;
- give examples to show the influence of parents, peers and school on the development of the adolescent;
- outline the language skills acquired during the period;
- describe the cognitive abilities of an adolescent as distinct from those of a child;
- enumerate the developmental tasks of adolescence;
- discuss the typical characteristics and the problems faced by adolescents.

20.1 DEFINING ADOLESCENCE

Let us first define the term adolescence, ***"Adolescence is the period of development between childhood and adulthood".***

A boy or girl enters adolescence as a child and emerges as a man or woman, expected to be ready to assume an adult role in the society. For everybody, the years 11 to 18 are the most eventful. During these years there is rapid physical and sexual growth and maturation.

It is very difficult to say exactly when adolescence starts. However, onset of puberty is generally accepted as the beginning of adolescence.

What is puberty ? Let us find out. The period around 11 or 12 years of age is the onset of puberty which usually lasts for 2 years. During these years there is a spurt in physical growth and appearance of sex characteristics. The first sign of puberty in girls is menstruation and in boys, nocturnal emission (ejaculation of semen during sleep).

The physical changes that take place during adolescence are as follows:

Girls	Boys
1. A girl gains about 8cms in height between 11 to 13½ years of age.	1. On an average, boys grow about 20 cms in height between 13 to 15 years of age.
2. Develop more fatty and subcutaneous tissue giving rise to rounded contours.	2. Develop a lot of muscles, enabling them to do heavy physical work.
3. The shoulders are slender while hips become broader and rounded.	3. Boys develop broader and stronger shoulders while their hips remain slender.
4. Hair growth in the arm-pits and pubic area.	4. Hair on the body becomes darker and curlier. Hair appears in the arim-pits and pubic area. Facial hair appears at side of the mouth, lips, cheeks and then the sides of the face.
5. The voice becomes more shrill and adult like.	5. The voice breaks, i.e., becomes squeaky and matures. This happens because the larynx enlarges and vocal cord lengthens. Adam's apple becomes prominent.
6. Appearance of the breast-bud.	6. Increase in the size of the penis.

7. Onset of menarche or first menstrual cycle. First few cycles may be irregular and sometimes painful.	7. First nocturnal emission occurs nearly a year after the penis starts growing. The seminal fluid may not contain sperms at puberty.

Although the overall sequence of physical and sexual growth and maturity are comparable for boys and girls, girls attain their adult height, weight and ability to bear children, two years earlier than boys.

As you have studied during adolescence boys and girls have different nutritional needs. (Refer to table 5.5 of lesson 05 'Meal Planning').

INTEXT QUESTION 20.1

1. Select the most appropriate answer.

   (i) Adolescence is the period between

   (a) birth and childhood.
   (b) childhood and adulthood.
   (c) adulthood and old age.
   (d) childhood and old age.

   (ii) Adolescence begins and ends between:

   (a) 11 and 18 years of age.
   (b) 12 and 16 years of age.
   (c) 13 and 18 years of age.
   (d) 15 and 18 years of age.

   (iii) The first sign of puberty amongst girls is

   (a) growth of pubic hair
   (b) appearance of breast-bud
   (c) onset of menstruation
   (d) nocturnal emission

   (iv) The first sign of puberty amongst the boys is:

   (a) facial hair growth
   (b) nocturnal emission
   (c) breaking of voice
   (d) appearance of pubic hair

2. From the following list (√) mark those changes that take place in boys/ girls/both during adolescence.

		Boys	Girls
1.	More fatty tissues and rounded contours	.....	.....
2.	Slender shoulders and broaders hips	.....	.....
3.	Broader and stronger shoulders and slender hips	.....	.....
4.	Dark, curly hair on the body	.....	.....
5.	Squeaky and mature husky voice	.....	.....
6.	Onset of menarche	.....	.....
7.	Growth in arms and legs	.....	.....
8.	Growth in height	.....	.....

20.2 EARLY AND LATE MATURATION

Some adolescents undergo the physical changes described above, earlier than others. This has a specific influence on the psychological aspects of their development.

It is generally seen that the early maturing girls feel very conscious and odd about their bodies and they think why is it happening to them ? Since they look grown up, adults expect them to behave more responsibly. Late maturing girls look younger and are not expected to measure up to adult standards of behaviour. Therefore they are more relaxed. However, they do not get attention from boys.

Early maturing boys are more confident as compared to girls. Because of their greater physical strength and well developed bodies they are chosen leaders. They are satisfied with themselves. At the same time, adult expectations from them are high. Late maturing boys feel inferior because of lack of physical growth and they keep thinking whether they will ever become big and strong like their friends.

Usually these feelings are temporary and as adolescents grow they get over these feelings as well. Parents need to talk to adolescents and explain to them the physical changes that take place in the body. They should also give them sex education.

20.3 SOCIO-EMOTIONAL DEVELOPMENT OF ADOLESCENTS

Adolescents have mood swings in the early years. They cry and laugh easily,

they are moody and irritable because they do not understand about all the changes that are taking place in their bodies. But as the years pass the hormonal activity within them settles down. With this their vulerability also disappears.

Socially, they like to be with the peer group most of the time. This group has its own culture, values, language, dress style, music and other likes and dislikes. Comforming to the group norms is an important objective of all adolescents. This is the reason adolescents have many friends. Anyone who cannot make friends goes into depression which can have dangerous consequences.

20.4 LANGUAGE DEVELOPMENT

You know that by the end of middle childhood the child has a vocabulary of about 4000 to 5000 words. With greater use of the vocabulary already learnt, the adolescents' language becomes fluent and complex. They are able to add many more words to the vocabulary and also use them for forming complex sentences. All this helps them to communicate fluently.

A characteristic feature of the language development during adolescence is the use of 'slang' and 'short forms' for words. **Slang** can be called a word used to represent a set of words or an idea. For example, chicks is a slang word for pretty young girls while 'bindaas' means carefree attitude. Can you think of some slang words?

Another feature is the beginning of the use of stage short forms or abbreviations e.g. Connaught Place becomes C.P. and Greater Kailash becomes G.K. For many people these characteristic features of the language continue in their adult lives as well.

20.5 COGNITIVE DEVELOPMENT

Before a child enters adolescence, he/she needs to see things to be able to understand the relationship between them. During adolescence all that changes. The adolescent's thinking becomes abstract. The adolescent can imagine situations and events. For example on being told that A is bigger than B, and B is bigger than C, a 15 year old can draw the conclusion that A is bigger than C. A child who has not entered adolescence, would have to see the objects A, B and C before she can come to a conclusion.

The adolescent is able to think contrary to fact ideas. For example, if an adolescent is asked to tell the advantages of "if we all could fly", the adolescent can think of answers like- "There would be no need for vehicles". Can you think of some more advantages? With this imaginary and contrary to fact ideas, the adolescent is able to understand similies, abstract jokes with meaning which have to be inferred. These abilities enable the adolescent to

take decisions by thinking of all the possible alternatives for the solution to a problem. Thus we can say that the adolescent's thinking becomes more mature and systematic.

20.6 ADOLESCENTS NEED SEX EDUCATION

You already know that by the end of adolescence the adolescent is sexually mature and should be prepared for marriage and family life. Therefore, the adolescent needs to be educated about his/her sexual development and needs to adjust to these changes. The adult sexual behaviour of an adolescent will be determined by the attitudes he/she acquires about sex. The parents and school environment can play a very important role in the acquisition of these attitudes. This education is also called 'education for reproductive health'.

During this time, the adolescent's preoccupation with sex is very natural. The appearance of secondary sex characteristics and the activity of hormones in the body raises many questions in his/her mind. He/she depends on information from the peer group and from printed material. The kind of information the peer group gives is not always correct and contains a lot of misconceptions and fallacies. Similarly, the printed material if available is not always of good quality and can be very misleading. It can confuse the adolescents rather than do any good. Therefore, parents can play the role of informed adults who can handle questions about sex. Majority of parents feel very awkward and do not know how to handle the questions adolescents ask. It is important that parents develop a wholesome relationship with their wards so that they do not feel any hesitation in asking questions and the parents should not hesitate in giving the right answer to the question asked.

INTEXT QUESTION 20.2

I. Select the most appropriate answer. Give a reason for your selection.

(i) Early maturing girls feel

(a) good and confident (c) conscious and confident

(b) conscious and odd

Because.....

.....

.....

(ii) Which of the following do not get attention from the boys?

(a) Late maturing girls (c) Both the above

(b) Early maturing girls

Because.....

.....

.....

(iii) Amongst boys, the chosen leaders are:

(a) Late maturing boys (c) any one of the two

(b) Early maturing boys

Because.....

.....

.....

(iv) Adolescents usually do not rely on them for information about sex

(a) peers (c) grand parents

(b) printed material

Because.....

.....

.....

20.7 ROLE OF PARENTS

During this period, the adolescents want independence from their parents and yet they are dependent on them for their needs. They do not like to be told "Do this" and "Don't do this". Parents still want to control them while the adolescents want freedom and this leads to a tussle between the parents and adolescents. Here, the parents have to decide how much control they should exercise on their adolescent children, how much freedom is to be given, in which area they can let the adolescent have his/her say and in which they need to put their foot down. In short, the parents have to work out a congenial and workable disciplinary technique.

Let us discuss some parenting styles and their influence:

(1) Parents who give more freedom to the adolescent as he or she grows and at the same time take interest and responsibility for adolescent's decisions, encourage the adolescent to become more independent and responsible.

(2) Parents who are very strict and who play the role of an authority figure, i.e., who do not let the adolescent take any decision on her own, seriously hamper the adolescent's ability to be independent.

(3) On the other hand if parents are indifferent, i.e., who leave the adoles-

cents with their problems and do not interact with them, have children who grow up with indifferent attitudes.

Parents who encourage the adolescent to participate in family matters, value their opinion and take more interest in their activities, have children who are more confident. Thus, we can say that the parent-adolescent relationship should be based on mutual respect and love. Examine your relationship with your parents. Do you face any problems? How do you and your parents solve them?

Also remember, just as the parents understand their adolescent, the adolescent should also understand parent's point of view and take their advice - parents have years of experience behind them.

20.8 ROLE OF PEERS

Fig. 20.1: Peer Interaction

During adolescence, most often between the ages of 14 to 16, there is a gradual shift from parents to peer group (same age-mates). The changing family structure i.e. extended family (grandparents, parents and children) breaking and giving rise to nuclear family, makes the peer group very important. In nuclear families, the adolescents do not have anybody to talk to about their problems. This is because the parents are busy earning a living and there is no one else at home.

As you already know, even as children we are influenced by peers and today, also, the peer group plays the same role i.e. learning to interact with agemates, developing age relevant skills and interests and sharing problems and feelings.

During adolescence the peer group becomes more important because of the following reasons:

(i) Everybody is going through the same conflicts and problems.

(ii) The general feeling is that the peers understand them more than their parents.

(iii) It is during adolescence, that the individual learns how to interact with members of the opposite sex. The peer group provides this opportunity for interaction.

(iv) All adolescents feel it is very important to talk, walk, speak, dress and generally behave like their peer group does. This is often called the **"peer culture"**. Can you give an example? Yes, one example could be wearing of one earring by the boys. Another could be cutting hair too close or growing them too long.

Many people feel that "peer culture" is a way for the adolescents to feel different from their parents. They have their own code language and dress code.

It is important that the parents let the adolescent be a member of the peer group, but they need to keep an eye on their activities, as these activities might unknowingly be anti-social in nature, for example, forming of gangs and indulging in street violence.

However, it is not always true that parents and peer group are absolutely opposite to each other. Many a time, peer group can reinforce parental values, if it is of the same socio-economic status and educational level as the adolescent's family.

Peers can have harmful effects as well. A boy or girl who is laughed at or rejected while forming heterosexual relationship may develop a lot of anxiety. Also, the adolescent may be pressurized by the group to indulge in activities against their own judgment which they might later regret, e.g., pressurising the adolescent to try drugs or to lift things from shops, etc.

20.9 ROLE OF SCHOOL AND TEACHERS

School is a major institution, other than the family, which is responsible for teaching a number of social as well as academic skills to the adolescence. Whether or not an adolescent does well in studies depends to a large extent on the school environment and teachers.

If the school discipline is not very harsh and the student's point of view is respected, the adolescent is more likely to enjoy academic work. When the teachers are properly trained, warm and enthusiastic and recognize the hidden talents of the students, they bring out the best in the adolescent which makes them feel very good about themselves.

On the other hand, poorly trained, incompetent teachers with large classes, a lot of work load, rigid curriculum and regulations can have a negative impact on the students. This does not give enough opportunity to the adolescents to solve the questions and satisfy the thoughts that come to their mind. As a result, they may lose all interest in studies and are not motivated enough to do well. Many of them may even drop out of school.

Parent's active interest and their feelings and attitudes about the school and teachers can also influence how the adolescents feel about school and teachers. The adolescents may regard the school and teachers the way the parents do.

Apart from playing the important role of teaching academic and social skills, the school can play a very important role in bridging the "generation gap"

between the parents and the adolescents. The teacher occupies a central position between the two, if the teacher is liked by the students, they are more likely to listen to the teacher than their parents. The teacher can use this opportunity to explain to the adolescents the parents', or rather the adult's point of view in a friendly manner.

Peers in school can play another important role, as far as academics or studies are concerned. Since it is very important for the adolescents to be a part of the peer group, if the peer group lays a lot of stress on studies, the adolescent would also study hard to be a part of her/his group.

INTEXT QUESTIONS 20.3

1. Complete the statements in column A by matching them with those in column B.

Column A	Column B
(a) When parents allow freedom and take interest in adolescent's activities	(i) Adolescent becomes dependent.
(b) When parents are very strict and authoritative.	(ii) Adolescent becomes independent.
(c) When parents leave adolescents on their own	(iii) Adolescent becomes independent and responsible.
	(iv) Adolescent becomes confident but indifferent.

2. List at least two examples, other than those given in your study material for each of the following.

i) Peer culture ii) Harmful peer pressure iii) Positive peer influence

a)..... b)..... c) .....

a)..... b)..... c) .....

20.10 DEVELOPMENTAL TASKS DURING ADOLESCENCE

Till now we have talked about development in different areas that occur during adolescence. This development has an important impact on the emotional development of the adolescent. These are called the developmental tasks. Let us list them.

(1) The first most important task is accepting one's physique or body and using it effectively.

(2) Achieving new and more mature relationships with age-mates of both sexes.

(3) Achieving a masculine or feminine social sex role, i.e., ability to become a responsible male or female adult member of society.

(4) Achieving emotional independence from parents and other adults.

(5) Achieving a set of values, i.e., an ideology.

(6) Preparing for a career.

(7) Prepare for marriage and family life.

INTEXT QUESTIONS 20.4

1. Give two important characteristics of an adolescent's language.

   .....

   .....

2. List two important features of adolescent's thinking.

   .....

   .....

3. Enumerate any three developmental tasks of an adolescent.

   .....

   .....

4. Mention two emotional and two social characteristics of adolescents.

   Emotional < Social <

20.11 TYPICAL CHARACTERISTICS

After reading extensively about the adolescence period, can you think of some characteristics or behavior which are typical of adolescence and which make the adolescent so different from adults and children? Let us discuss these.

- The first is the adolescents' pre-occupation with their looks and their bodies. All adolescents feel that these changes are unique and everybody is looking at them. Some psychologists describe it as feeling "on stage all the time". All adolescents worry a lot about their looks and have a lot of anxiety about developing pimples about getting/not getting a beard, etc.

- All adolescents love to follow the 'peer group culture'. This group develops a peculiar way of talking, walking and behavior which seems very strange to adults.
- During this period, adolescents also experience "crushes", i.e. intense feeling of love towards a much older member of the opposite sex. Peers of opposite sex might seem too immature and childish during that period.
- Another characteristic of adolescents is their "idealism". Adolescents have passionate ideas about how good people should be, how they should behave and they generally believe in an idealistic world where everything is good, clean and just.
- All adolescents experience feelings of rebellion at one time or another. They feel the parents and adults do not understand them and they do not want to conform to adults' ideas. They also take a lot of pleasure in doing things which the parents disapprove of, e.g., wearing different kinds of clothes or having tattoos on their bodies or listening to loud music. Almost all adolescents feel the 'generation gap' between the parents and their own generation.
- All adolescents, at one time or another, experience extreme "mood swings". Do you know what are 'mood swings'? If something happens which the adolescent does not like, he/she will feel very depressed. For example, if a friend does not visit or telephone, it is reason enough to feel depressed. Do you experience such mood swings ? How do you come out of these moods ?

Adolescents are, as yet, not fully mature emotionally. They get easily influenced by what the others tell them. If somebody talks to them and tries to win their confidence, they easily confide in that person. This is because adolescents accept people on the basis of what they are saying rather than their motive.

One of the important tasks of adolescent development is their identity formation. The question 'who am I? haunts their mind most of the time. If the adolescent themselves, the people surrounding them especially their peers, are happy with their qualities, physique and behaviour, they develop positive self concept. With increased cognitive abilities they form their own sets of rules and hence their own identity.

20.12 ADOLESCENTS, TOO, HAVE PROBLEMS

During adolescence, physical changes take place very fast. Development takes place in other areas as well. The expectations of parents and other adults change. All this confuses the adolescent very much. With parents and

peer support, most adolescents emerge out of this period as mature individuals but some may develop disorders in their behavior. Let us talk about them in brief.

(1) Eating Disorders

Some early maturing adolescents may feel that they are becoming too fat and may stop eating required quantities of food. Others may think that nobody loves them and in order to get attention they start overeating and grow fat. Some others become very sensitive and they vomit when they are scolded or when they are tense.

(2) Suicidal tendencies

Many adolescents are unable to form friendships with their peer group. They do not trust parents either. In such situations, they might feel very lonely and think nobody loves them. This can lead to suicidal tendencies, which might just be to get attention or may be serious attempts.

(3) Peer Pressure

To prove to their friends that they are 'macho' (strong and grown up), the adolescents may indulge in alcoholism, smoking and may even take drugs under peer pressure. All these problems usually occur because the adolescent or 'young adult' is very sensitive during this period and the slightest neglect from friends and family is perceived as a dire situation. These problems can easily be handled by understanding parents and caring friends.

(4) Personal problems

Adolescents have number of personal problems related to their looks - too fat or too thin, too tall or short. They are worried about the shape of the nose, their own clothing sense, etc.

(5) Social problems

They do not like to participate in social and family functions. Adolescents hesitate in the company of opposite sex for the fear of being ridiculed and judged.

(6) Biological Problems

Biological problems of adolescence are complicated for both boys and girls, but more for girls. Girls find it more difficult to share their problems with others. They do not know how to seek information about changes in their body.

They develop a sense of fear towards consulting medical and health professionals regarding their problems. There is no proper education on problems

of health, particularly reproductive health among adolescents. Religious rituals and superstitions wrongly prescribe a number of unhygienic practices that affect the girls psychologically during puberty and menstruation in particular. There is a serious need to provide appropriate knowledge and counselling services for the adolescents.

(7) Teenage pregnancy

In India early marriages are common, therefore sexual activity starts at an early age for most of the women. Do you know what is the legal age of marriage for boys and girls in India? For boys it is 21 years and for girls it is 18 years. Marriage before this age is illegal.

In India, adolescents in large numbers are still married even before they are fully physcially developed. Pregnancy and motherhood, therefore, also occur before the reproductive maturity is attained. Teenage pregnancy, whether within marriage or outside it, is often unplanned and leads to serious mental and physical health, social and economic consequences. Pregnancy at an early age can result in severe damage to the reproductive tract because of difficult child birth. Babies born to adolescent mothers are generally under weight, are more likely to die at birth or in infancy. Do you realise that pregnancy at an early age also results in large family size which may have a negative effect on quality of life? Early childbearing also results in psychological strain on the young mother and curtails her educational and employment opportunities. Adolescent pregnancies often result in societal disapproval and include shame, guilt, embarrassment and fear. To avoid these, one may end up seeking help from an unqualified person who may use improper methods to terminate the pregnancy.

If you or your friend faces such a situation, you should not hesitate to seek help from the elder members of the family. It is also useful to know about the means and methods of avoiding an unwanted pregnancy. Advice on these matters can be obtained from any qualified medical or nursing personnel in your neighbourhood.

INTEXT QUESTIONS 20.5

1. Given below is a list of characteristics, select the ones you will associate with adolescence.

   (a) feeling of being ‘on stage’

   (b) ego-centrism

   (c) stranger anxiety

   (d) peer group culture

(e) crushes
(f) concrete thinking
(g) idealism
(h) rebellion
(i) work ethics
(j) generation gap
(k) sibling rivalry
(1) abstract thinking
(m) mood swings
(n) mature thinking
(o) easily influenced

2. Select the most suitable answer from the four given choices at the end of each statement.

i) Eating disorders in adolescents relate to
   a) Undereating, overeating and vomitting
   b) shrinking of stomach due to growth spurt
   c) peer pressure
   d) mood swings

ii) The suicidal tendency in adolescents develops because of
   a) eating disorders
   b) peer pressure
   c) biological problems
   d) Loneliness

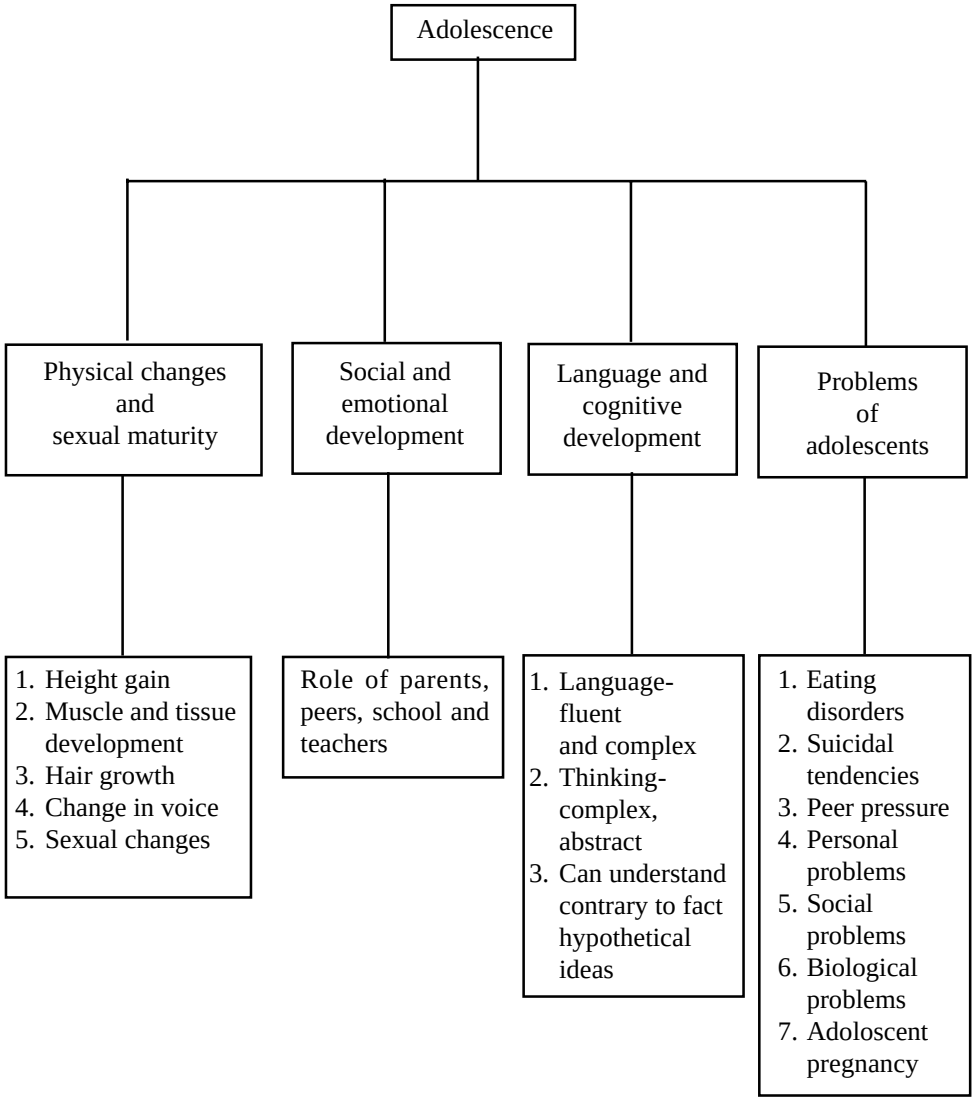
iii) Adolescents require education on reproductive health because
   a) they are growing fast
   b) they need to accept their physique as it is
   c) they need to achieve male/female sex roles
   d) they need to prepare for marriage and family life.

iv) Adolescents feel rebelious towards authority because they feel
   a) adults do not trust them
   b) adults do not understand them
   c) there is peer pressure
   d) they have grown up.

3. List two damages to health and two economic damages one can suffer due to early marriage.

Damage to health	Economic damage
.....	.....
.....	.....
.....	.....
.....	.....

WHAT YOU HAVE LEARNT



TERMINAL EXERCISE

1. Explain the term 'adolescence' in your own words.
2. Tabulate the physical changes that take place in girls and boys during adolescence.
3. Discuss the effect of early and late maturation on adolescents.
4. What role can the parents play in imparting sex-education to their children?
5. Discuss the various ways by which the parents discipline their children during adolescence. Which technique according to you is the best?
6. Discuss the role played by the peer group during adolescence.
7. "Good school environment and trained teachers are most important for motivating adolescents to do well in schools". Do you agree with this statement? Support your answer with examples.
8. What are the characteristics of the cognitive development during adolescence? Discuss.
9. Enumerate the important developmental tasks of adolescence.
10. List the typical characteristics as well as problems of adolescence.

ANSWERS TO INTEXT QUESTIONS

20.1 1. (i) (b) (ii) (a)
(iii) (c) (iv) (b)

2. Boys - 3,4,5
Girls - 1,2,6

20.2 1. (i) b- because they do not understand what is happening to them also even though they are young they are expected to behave in a more responsible manner.

ii) a- because they do not look mature and are treated as a child.

iii) b- because of their greater physical strength and well developed bodies.

iv) c- because adolescents feel hesitant and shy in getting this information from grandparents.

20.3 1. (i) (d) (ii) (d) (iii) (d)

2. i) a) wearing torn and faded jeans
b) blindly following fashion

ii) a) smoking and drinking
b) bunking work/school
iii) a) Trying to do better in exams
b) Encouraging each other to learn new skills.

20.4 1. (i) slang, short-forms (ii) concrete, abstract
(iii) refer to text
(iv) Emotional < moody, irritable / suicidal tendency

social < want to be a member of peer group / want to conform to group norms

20.5 1. a, d, c, g, h, j, l, m, o.
2. (i) a (ii) d (iii) d (iv) b

AUDIO - ***shishu vikas ke siddhant***
VIDEO - ***Adolescents***

21

321en21

CONCERNS AND ISSUES IN HUMAN DEVELOPMENT

You have already studied about the development of children across ages and about the factors which affect their development. But, there are children who do not get adequate environment and facilities for their full development. For example, the neglect of girl child in Indian families is a well known fact. Many children instead of being in school, have to work in hazardous occupations while still others may indulge in anti social acts. Some children are differently abled. Children whose parents or themselves are HIV positive or suffering from AIDS are shunned by society. Some children start taking drugs first by chance or under peer pressure and become addicted to them. They all need our special attention. In this lesson we shall study about the special issues related to these children and shall try to find out some of the ways to help them.

OBJECTIVES

After studying this lesson you will be able to:

- give example of common discriminations against the girl child;
- explain the term and enumerate the causes of 'juvenile delinquency; suggest remedial and preventive measures;
- relate the consequences of child labour on development of the child;
- suggest ways of reducing the problems of 'socio economically disadvantaged children';
- list some major physical disabilities in children, describe the problems faced and suggest ways to help them;

- suggest guidelines to help mentally retarded children;
- define the terms 'AIDS' and 'HIV' and list myths and misconceptions regarding AIDS;
- suggest ways to ensure safe motherhood leading to lower morbidity and mortality;
- define the term substance abuse, give symptoms and effects of drug abuse.

21.1 DISCRIMINATIONS AGAINST THE GIRL CHILD

Read the following story -

Seema is a ten year old girl living in a small hut. She gets up at five in the morning and goes out to perform household chores in others' houses. Her brothers who are older to her are forcibly sent to school when they have no interest in studies and have failed two/three times. Whenever Seema expresses her desire to go to school she is scolded by her parents. Her brothers are considered assets to the family while Seema is considered a burden.

After reading the story how do you feel about Seema's life? Is it not the situation of many girls in India?

The girl child in India faces a difficult life. She is discriminated against right from birth or even when in the womb. She is an unwanted, uncared for and an inferior being in most of the families. Can you outline the discriminations against her? Here are some of them.

Who takes food first in an Indian family? Is it the girl child? No, most mothers in our country tend to feed their husband and sons first. They give only left over food to their daughters. Such food is often inadequate in quality and quantity, e.g. many times girls do not get adequate amounts of dal, vegetables, chapattis, etc. The discrimination in feeding habits begins soon after the birth. Do you know that female infants are breast fed for shorter duration as compared to male children?

What happens when an individual does not get adequate amount of food? The person fails to develop resistance to diseases and falls sick frequently. When girls fall sick, are they taken to the doctor? No, because good health is not considered important for them. As a result many little girls fail to see their first birthday. In this way a girl child is denied even basic **nutrition and health facilities.**

Is the number of girls attending the school same as that of boys? The answer is 'no'. Because many of them are taken out early from the school even before they complete their basic education. Girls start helping their mothers in the household tasks at a very early age.

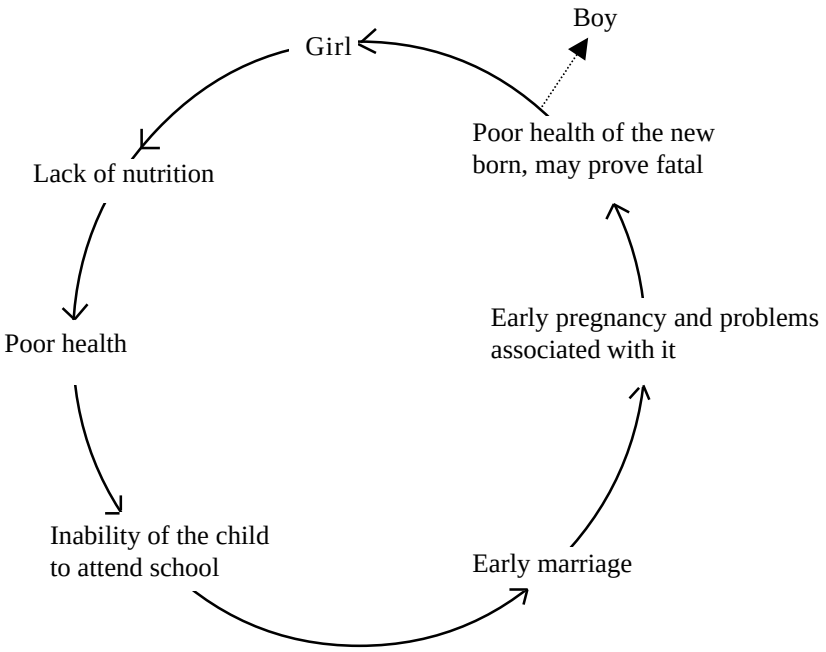

Girl
Boy
Poor health of the new born, may prove fatal
Lack of nutrition
Poor health
Early pregnancy and problems associated with it
Inability of the child to attend school
Early marriage

Fig. 21.1 A vicious cycle

21.1.1 Role of Education

What role can education play in her life? It is the girl child who will later on weave the life of every member of her family. So, education is very important for her. It helps her in the following ways–

1. Education creates awareness among girls. They know what is happening around them, what is good or bad, how they can use/avoid these. Educated girls can run their own lives and households more efficiently e.g., they would know their rights as consumers and can purchase best possible items for their families in the given amount and maintain account of household income and expenditure.
2. Education gives them financial independence. Education imbibes confidence and skills in girls which enables them to take up a vocation if required and hence provide financial help to the family.
3. Educated girls who will later on become educated mothers can look after the studies of their children. Educated mothers help their children to develop good habits and values.
4. Educated mothers understand the day-to-day problems their children may face and help in providing more meaningful solutions to these problems.

If the parents educate their girl child they will not only help their daughter but also make her a better daughter-in-law, wife and a mother. This in turn will help the entire society.

After reading about the discriminations against the girl child how would you like to treat your daughter? What role can you play to change the attitude of your community towards the girl child?

INTEXT QUESTIONS 21.1

1. Give three indicators which show discrimination against girls.
2. The girls are discriminated against because they
   (i) .....
   (ii) .....
   (iii) .....
3. State three ways in which education helps a girl child.
   (i) .....
   (ii) .....
   (iii) .....

21.2 WHAT IS JUVENILE DELINQUENCY ?

Do you read the newspaper everyday? What are the main stories? Who are involved in these incidents? The children and the teenagers. Do you think this kind of behaviour is socially acceptable? No, these are antisocial behaviours and cannot be accepted.

Fig. 21.2: Juvenile delinquency

Juvenile delinquency means acts of violation of law by the young people (a boy below sixteen years and a girl below eighteen years) who as a rule cannot be punished by the law.

Can you list some of the behaviors which are considered 'delinquent' ? Yes. some of them are –

1. Forgery
2. Violence
3. Stealing
4. Suicide
5. Telling lies
6. Sex crimes
7. Drug peddling, etc.

21.2.1 Causes of Juvenile Delinquency

Delinquency among young people can be caused by a number of factors. Here are some of them.

Poverty is one of the major causes of juvenile delinquency. Poor children do not have adequate facilities and comforts of life. They find stealing and robbery an easy means to get the facilities. So the young people indulge in thefts, robbery, etc. Sometimes because of poverty, parents also encourage their children to take up such activities.

Can bad company turn an individual delinquent? Yes, young people pick up activities like stealing, telling lies, breaking window panes, etc., in order to influence the leaders of their group. Later on these become habits.

Does violence in media encourage delinquency ? Yes, violence in films and books depicts the delinquent as a strong character. The young boys who watch these acts identify with these characters and try to imitate their behavior.

Regular fights among parents is yet another reason for this problem. When parents quarrel with each other their voices are raised. Children do not understand these fights and get scared. The fight brings a feeling of insecurity in them.

The following chart sums up the causes of juvenile delinquency.

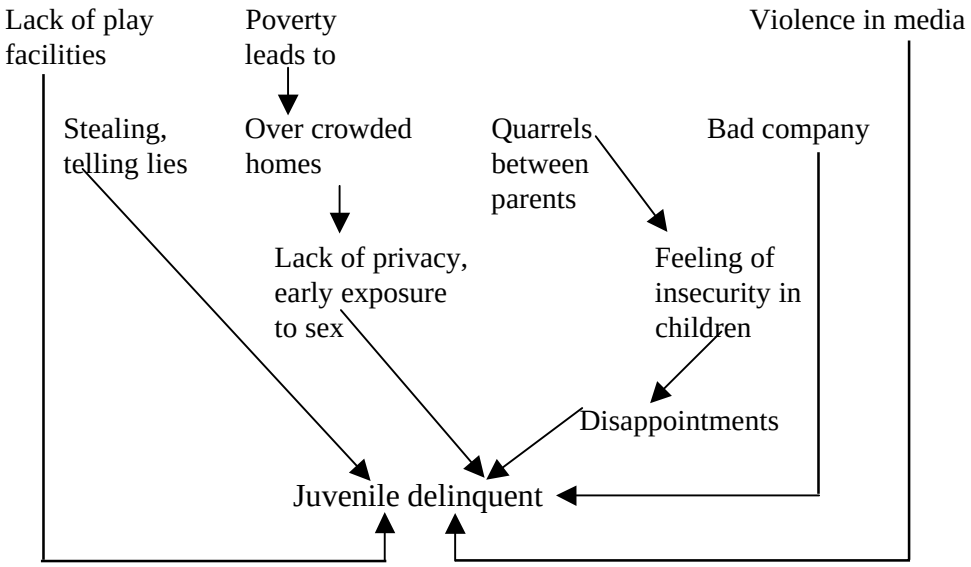


Fig 21.3 Causes of Juvenile Delinquency

21.2.2 Remedial and Preventive Measures

What happens to the children who behave in a delinquent manner? On specific complaints of the people, they are taken out from their neighborhood to a place called remand home. What is done in the remand home ? Here, the children are given opportunities to give up their delinquent manners. Facilities for vocational training are available which enable them to stand on their own feet. Besides these remedial measures we can do things which can prevent the problem from occurring. What are these ?

Since poverty is the main cause of juvenile delinquency we can do some thing to remove it. Do you know that there are many **poverty removal programmes** in our country? Try and find out those institutions which provide loans at a very nominal rate of interest to start a vocation. Is there any voluntary organization working in your neighbourhood ? Can you approach it to provide vocational training to poor people?

Parents must spend time with their children, discuss their problems and patch up their differences. Enable them to develop good habits and sound values. After studying this, how would you like to behave as parents or future parents with your children?

Provide recreational facilities to young people as it will help them to spend their time gainfully.

Activity 21.1: Look around and see if there are some children who remain unattended. Can you organize some useful recreational activities for them? List how this would help them.

S.No.	*Activities organized*	*How these helped*

INTEXT QUESTIONS 21.2

Answer the following questions in two lines.

1. Who are juvenile delinquents ?

   .....

   .....

2. What kind of behavior is delinquent?

.....

.....

3. Which factors lead to delinquency ?

.....

.....

4. If delinquency is due to poverty what kind of input should be provided to the delinquent ?

.....

.....

5. How do the play facilities enable the young people ?

.....

.....

21.3 CHILD LABOUR-CAUSES AND CONSEQUENCES

Look around in your neighbourhood and try to find out the jobs where children are involved. You will find that they are selling newspapers, working, in dhabas, cleaning cars, polishing shoes or working in houses as domestic help, etc. Is there anything wrong when children work? Yes, because this is not their age to work and earn a living. They need to be in school and acquire knowledge. Long hours of working denies them the opportunities for their development.

How do you classify a labourer as a child labourer? Yes, on the basis of the age.

Any child who is below fourteen years of age and is engaged in work to earn a living is a child labourer.

Can you think of some of the causes of child labour ? Let us try to list some of them. These are :

Causes	Consequences
• Poverty • Illiteracy and ignorance of parents • Orphaned, abandoned and rejected children • Nimble fingers and keen eyesight which are assets in traditional craft e.g. carpet weaving.	• Children are made to work for long hours (12-16 hours) in uncomfortable body positions and this may cause permanent disability. • They work in unhygienic conditions and often suffer

• Demand for such labour which is cheap, silent and uncomplaining.	from infectious diseases. • They miss schooling and thus add to the number of illiterate in the country.

21.3.1 Dealing with the Problems of Child Labour

Do you recall how we dealt with the problem of poverty in section 21.2.2 ? Can those methods be adopted here also ? Yes, those methods can be adopted here also.

- Make provisions for non-formal education. The employers must motivate them to attend school by freeing them for a few hours during working time. The employer should also make arrangement for schooling if necessary.
- Educate parents so that they can realize the negative consequences of child labour and the importance of educating children.
- Provide medical facilities and arrange regular health check up camps.
- Allow children to work in clean, well ventilated and illuminated rooms for fewer number of working hours as compared to adults.

Activity 21.2 : To identify a child labourer in your locality and develop a profile. How can you help this child?

INTEXT QUESTIONS 21.3

1. Give three reasons why parents send their children to work.
   (a) .....
   (b) .....
   (c) .....
2. List three conditions under which children are made to work.
   (a) .....
   (b) .....
   (c) .....
3. List three methods by which the problem of child labour can be dealt with.
   (a) .....
   (b) .....
   (c) .....

21.4 SOCIO-ECONOMIC DISADVANTAGED CHILDREN

Read the following story.

Radha is a ten year old girl. Her parents work at construction sites. Being the oldest she takes care of her four siblings in the absence of her parents. The whole family is living in utter poverty. To forget his miseries, her father often comes home drunk and fights with his wife. Earlier, Radha used to go to school but she was taken out because her father could not afford the fees.

Children like Radha are called ***socio-economically disadvantaged children.*** They live in ***extreme poverty.*** These children are underprivileged and their parents fail to provide adequate facilities for their proper physical, mental, social and emotional development.

21.4.1 Helping Socio-Economically Disadvantaged Children

How can we help socio-economically disadvantaged children? What can be done to facilitate all round development of such children ? Here are some suggestions.

- ***Provide education.*** Give them ***incentives*** like free books, stationery, uniforms, scholarships and mid-day meals in schools. This will encourage their parents to send them to school. This has already started in some schools at some places.
- Along with education, provide them ***vocational training*** so that they can take up a vocation after completing school. This will infuse ***self-confidence*** in such children and help them handle different situations in life.

You may read more about such issues at ***http://freethechildren.org***

Activity 21.3 : After studying about these children, try to locate such children in your neighborhood. Think of the services which you can provide for them. Can you start teaching them in your free time ? If yes, go ahead and start the mission!

INTEXT QUESTIONS 21.4

I A children's club held a meeting to discuss how they could help socio-economically weaker children of their area. They made mistakes while writing the suggestions. Unscramble the words to find out what you can do to help such children of your area.

i) HTCAE such children.

.....

ii) TODNAE old games and OYST.

.....

iii) Donate old OOKBS and comics.

.....

iv) Teach some SKLIL.

.....

v) Teach personal GYNHEEI.

.....

vi) Organize LEADNUOCIAT games.

.....

vii) Provide SNUOITIRTU snacks.

.....

viii) Organize FRCAT activities.

.....

ix) Teach them SAOMRL through story telling.

.....

x) Encourage them to attend LOCSHO.

.....

21.5 MAJOR PHYSICAL DISABILITIES

Rani can not walk because she had suffered from poliomyelitis when she was younger. Ramesh, a five year old boy, finds it difficult to control his head. Subodh can not read Pinky's story books-he is blind. Ajay can not speak and hear but understands his mothers gestures.

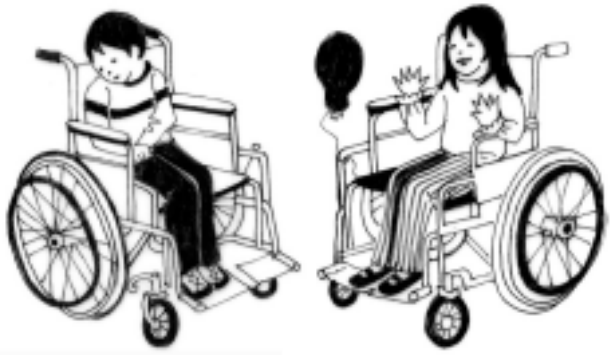
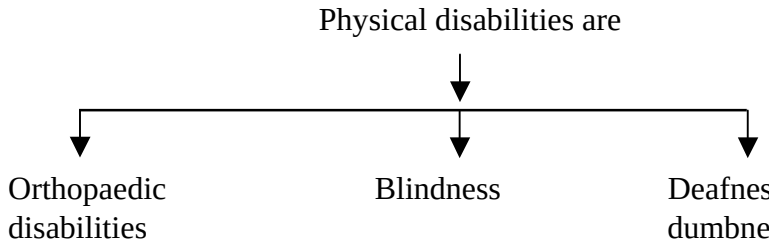


Fig. 21.4: Children with orthopaedic disabilities

What is wrong with these children ? Yes, they are unable to perform some of the activities which you and I can. Such children are called physically **disabled children.**

The disabled children can not perform one or more activity in a manner which is considered normal for a human being.

Can you list some of the major physical disabilities found in children?



Have you seen children who do not have or can not use their hands or legs or any other part of the body ? These children are called **orthopaedically disabled**. The major causes of orthopaedic disability are malformation of bones, deficiency of calcium and vitamin D, and accidents causing damage to the bone. You must have heard about Sudha Chandran - a classical dancer. In 1981 she met with an accident and her leg had to be amputated (cut off). The gutsy Chandran got back to the dance floor with an artificial foot called 'Jaipur foot'. She has been giving regular dance performances even after the accident. Hers is a classic case of inner resolve and determination. She overcame her disability with the help of 'Jaipur foot' to become one of India's acclaimed dancers. Remember there are many Sudhas hiding amongst us. All they need is our support and encouragement.

Some children have stiff muscles. Such children are called **spastics.** What kinds of problems do they face ? These children have *problems in movements and body positions.* They often have slow and faulty movements of hands, head or legs. The degree of stiffness in spastics varies from child to child.

Have you seen **blind/partially blind** children in your neighborhood ? What is their problem ? Partially blind can see very little and the blind see nothing. Many children have problems in seeing things clearly. We may not pay attention to the fact that the child has a seeing problem until we notice that the child has *difficulty in threading the needle, reading bus numbers or reading letters from the black board.* Such children can see much better with spectacles. Who can forget the contribution of Surdas to Indian literature ? Despite being blind he did not let that affect his creative output.

Do you know that only some children are born blind and in a majority of the cases blindness is acquired ? *Lack of vitamin A in daily meals and injuries to the eye are major causes of blindness.*

There are some children who can not hear or speak. They are called **deaf** and **dumb.** How do parents recognize whether their child is deaf? Parents often notice early that their child cannot hear because the child does not respond to even loud noise. Children born deaf have difficulty in acquiring language. Can you guess the reason for it ? This is because they can not hear either their own voice or that of their parents and hence language has no meaning for them. *Loud noise, ear infections, putting pins, crayons, etc., into the ears* to take out ear wax are some of the major causes of deafness in children. However, such hearing defects may be corrected by using hearing aids.

21.5.1 How to help disabled children

With your love, care, help and encouragement, physically disabled children can develop skills as early and as well as other children. Some of the ways to help them are presented here.

1. Let the child undergo medical examination as early as possible for assessment of disability. Why do you think it is important? Because, the earlier the disability is detected, greater are the chances of recovery from it.
2. Once disability is detected and assessed, help the child to learn to tackle it. It is good to admit a disabled child in a special school for short duration. Here the special aids and methods are used to help them get used to the disability. How does a blind child learn to read and write ? Yes, with the help of Braille. *Braille is the arrangement of dots representing alphabets and can be read by finger tips.* Similarly, a deaf child learns to read the lips and use the sign language.
3. Encourage disabled children to make use of *substitutes* for missing body parts. Can you name some such substitutes ? These are *braces, splits, artificial limbs, etc.* From where can one get them ? These are given free of cost or at a very nominal rate in government hospitals.
4. After learning to deal with the disability it is better to let the child be with normal children.
5. Encourage the blind child to use the remaining sight and other senses. How will you teach about shapes to a four year old child ? Yes, by using the sense of touch.
6. Help the blind child to use a stick while walking. Why do they need it ? It helps them in finding the way and makes them more confident.

7. Encourage the hearing impaired child to use and properly maintain *hearing aids.*
8. Encourage the child to make use of *speech and lip reading.* How is lip reading important to them? It helps them in understanding what other people are talking by focusing their attention to certain cues in lips and facial movements.
9. Allow the deaf child to use *gestures and sign language.*

Do you know that after finishing education many of the physically disabled persons can take up many jobs which are handled by normal people. The disabled persons do not need sympathy but your support to unfold their potential. Will you provide that to them? It only means matching the disbility and the job and providing the specific facilities needed. We have seen a physical education teacher managing the sports programme of a college with excellence and with 90% disability in the leg. Isn't Ravinder Jain a wonderful lyric writer and music composer ?

Activity 21.4: Identify a child with special needs and study the family's efforts in his/her achieving independence.

INTEXT QUESTIONS 21.5

1. Orthopaedically disabled children are those who have a problem in
   (a) speaking
   (b) seeing
   (c) listening
   (d) use of body parts

2. The best way to teach a blind child to recognize various shapes is by
   (a) drawing pictures
   (b) oral descriptions
   (c) feeling the shape
   (d) oral description and touch.

3. The children born deaf have difficulty in learning to speak because they
   (a) get startled by the voices of their parents
   (b) cannot hear their own babbling
   (c) prefer to listen than to talk
   (d) cannot hear any sound

4. A child who has hearing problem should
   (a) get the ears cleaned
   (b) use hearing aids
   (c) get practice in listening
   (d) concentrate on listening

5. To help rehabilitate disabled children it is important to
   (a) deal with them with love and care
   (b) provide medical help as early as possible
   (c) spend time with them
   (d) do all the above

21.6 WHAT IS MENTAL RETARDATION?

Fig. 21.5

Mental retardation is *delay* or *slowness* in a child's mental development. The child who is mentally retarded learns things at a slower rate than other children of the same age. The developmental milestones of such children are delayed. Can you give an example of it? Yes, the child may be late in learning to walk, talk etc., What do you think could be the reason for the delay? The reason is mental retardation which can be caused by diseases and/or injuries affecting the development of brain of the child e.g. brain tumors, poisoning from pesticides, lack of oxygen to brain, damage to brain from instruments used at the time of brith, injury to the brain in an accident, etc. The degree of mental retardation depends upon the extent of damage that has taken place in the brain. Some children are more retarded than others.

Helping Mentally Retarded Children

You might be wondering what can be done to help mentally retarded children. All mentally retarded children can be helped to learn self help skills to some extent. Some of them can also learn to read and write while some always require somebody to take care of them. How can you help these children to grow up to their maximum potential? Following are some of the guidelines:

– Never call these children 'stupid or idiot'. It hurts them as it would hurt you.
– Let the children do as much as they can by themselvles. Help only

For Extra Information log on to:
http://www.disabilityindia.org

when asked for. Slowly teach the children to dress and undress themselves, eat properly, share things with others and follow simple directions.

– If the degree of mental retardation is not very high, then involve the children in simple household tasks, e.g., house keeping and cooking simple food items like rice, make tea, boil potatoes, etc. This will not only keep them occupied but also make them independent.

– Enroll mentally retarded children in special schools where they are given training in some vocation for income generation.

INTEXT QUESTIONS 21.6

Choose the answers that are **not correct**

1. Mental retardation is delay in
   (a) Walking
   (b) talking
   (c) mental development
   (d) development of eating habits

2. Mental retardation is caused by
   (a) injury to the brain
   (b) disease which affects the growth of spinal chord
   (c) long illness
   (d) chronic cold and cough
   (e) lack of oxygen to the heart

3. Mentally retarded children can be taught
   (a) to look after themselves
   (b) to help in the house
   (c) to cook
   (d) some professional skill.

21.7 SEXUALLY TRANSMITTED DISEASES (STD's/AIDS/HIV/RTI's)

(i) WHAT IS RTI?

Sometimes, microorganisms may infect areas around reporductive parts. During the act of sexual intercourse, these micro organisms may be easily transmitted from one person to another leading to reproductive tract infections (RTIs).

(ii) WHAT IS STD?

Diseases which spread through sexual contact are called sexually transmitted diseases (STD).

Syphillis and gonorrhoea are examples of STDs. They are caused by bacteria and spread through sexual contact with an infected person. Symptoms of gonorrhoea occur in about 2-5 days whereas syphillis becomes evident in 10-90 days.

Symptoms

- fever and sores appear on the skin, in the throat and genital area; specially vagina or penis, anus, rectum and in the mouth.
- rashes on hands, feet and palms.
- white patches in the mouth.
- acne-like warts in the groin area.
- hairfall in patches from infected areas.

Prevention and cure

- maintain sexual intimacy with only one person.
- avoid prostitution or homosexuality.
- take appropriate medical treatment.

(iii) WHAT IS AIDS?

AIDS stands for **acquired immune deficiency syndrome**. It is called

Acquired	:	Because it is not inherited; one gets it from somebody.
Immune Deficiency	:	It gradually weakens and ultimately destroys the body's defence mechanism, i.e., ability to fight with disease causing germs.
Syndrome	:	It is not just one disease or symptom but a group of diseases.

AIDS is a condition caused by a virus called HIV that causes damage to the immune system of the body.

HIV/AIDS cannot be diagnosed on the basis of one sign or symptom. All the symptoms of AIDS can be the symptoms of other diseases too. Only after proper examination and test HIV infection can be diagnosed.

(iv) WHAT IS HIV?

The virus which causes AIDS is known as HIV which stands for *Human Immunodeficiency Virus.*

The weakening of the immune system by the virus inside the body of the infected person makes the person unable to resist other diseases.

There are currently two types of HIV viz., HIV 1 and HIV 2 which cause AIDS. HIV belongs to a family of many viruses called retroviruses. It is very tiny, even a thousand times smaller than the thickness of a hair. It looks like a rolled up procupine or a sunflower in full bloom.

HIV/AIDS and the Immune System

The immune system refers to the way in which the body protects itself from infection and diseases. The skin serves as the outer defence mechanism while white blood cells (WBC) are important in the working of the body's immune system.

Once a person is infected with HIV, the body produces the antibodies to HIV in an effort to protect itself. Antibodies are substances that are produced in the body to fight infection by viruses and bacteria. But these antibodies are not powerful enough to fight against the HIV virus. HIV attaches itself to the genetic material of some white blood cells. With this material from the cell, the virus reproduces itself. Once the virus enters and attaches itself to the cell, it is difficult to destroy it without damaging the cells. Destroying the virus means destroying the cells and making the immune system weaker.

21.7.1 Signs and symptoms of AIDS

Signs and symptoms, generally in HIV infected and AIDS patient can be the signs and symptoms of any other disease too. Whether a person is infected with HIV or not is known only by the blood test. A person with positive blood test may not suffer from AIDS at present but after some time this person may develop AIDS.

HIV infected people develop one or more of the following signs and symptoms:

- Persistent fatigue
- Severe weight loss (by at least 10% of the body weight);
- Night sweat
- Fever lasting several weeks, and

- Persistent diarrhoea lasting over one month.

Most people with HIV infection may not show signs or symptoms of the disease, but may develop AIDS after some years. That period is called the asymptomatic period and it may extend to ten years or more. But since they have HIV virus in their blood, they can infect others.

Common manifestations of a person with AIDS are:

- swollen lymph glands usually in the armpits, neck and groin region;
- white spots inside the mouth, throat or on the tongue caused by fungal infection;
- red, brown, pink or purplish blotches on or under the skin, inside the mouth, nose or eyelids;
- Tuberculosis (T.B.)

A person's body takes about two weeks to three months after infection to produce HIV antibodies. The length of time between HIV infection and AIDS can be ten years or more. However, the time taken varies widely from person to person. It may depend on the amount of virus present in the blood, individual immune system and exposure to repeated or severe infection, anxiety and depression. Other health risks such as smoking, overtiredness, low nutrition and heavy drinking may cause AIDS to develop earlier.

HIV Testing

HIV antibodies develop in the first three months after infection, so after three months it is possible to detect the HIV infection by blood test. Only in very rare cases the antibodies may take upto six months to develop. So, even if one tests negative after three months, it is a good idea to test again after six months.

21.7.2 Modes of HIV Transmission

HIV can be transmitted through blood, semen and vaginal fluids and from mother to child.

Infection through blood

Since this virus lives in the blood it can be transmitted through blood and blood products. HIV can also be transmitted through the use of needles, syringes, blades, knives, surgical instruments and other piercing instruments that have been used on an infected person. If these infected instruments are used on healthy people without proper sterilization it may cause infection. Improperly sterilized instruments used for circumcisions, tattooing, acupuncture, ear piercing and traditional healing practices can also transmit HIV.

Intravenous drug users are also at a great risk as the needles they share are rarely sterilized.

Infected mother to new born child

HIV can be transmitted from woman with HIV infection to her child before or during birth. Before birth, it may be transmitted across the placenta to the foetus and during childbirth from the mother's blood and through breast feeding. The chances of HIV passing on to the new born child are about 30 percent.

Infection through sex

The most common route of HIV transmission is unprotected sex (not using a condom) with an infected partner. Though chances of infection per single exposure is 0.1 to 1 %, yet 80-90 per cent of the world's HIV infections are through this mode. HIV is present in semen and in cervical and vaginal fluid of the infected person. This is why HIV has been described as the latest Sexually Transmitted Disease (STD). The presence of other STDs make the transmission of HIV much easier. This mode of HIV infection can be ruled out totally if people decide to follow safe sex practices.

For Extra Information log on to:
http://www.aids-india.org

21.7.3 Myths and misconceptions about HIV transmission

There are certain myths about transmission of HIV infections. One should know that the HIV does not spread by casual contact such as:

- Shaking, touching or holding hands
- Body contact in crowded public places
- Sharing cups, plates and other eating utensils
- Working in the same place
- Playing in the same place
- Playing or sitting together
- Sharing clothes, food, etc.
- Kissing and hugging
- Sleeping in the same room
- Sharing toilet, bathroom facilities and swimming pool
- Smiling and laughing together

Activity 21.5: Observe and record the information available on AIDS/ HIV through hoardings/banners/advertisements.

1. Find out the symbol of AIDS. Draw, colour and paste it in your practical notebook.

21.8 SAFE MOTHERHOOD

All lives are precious. In a family everybody has the right to be healthy. You can be happy only if you are healthy. Generally who is the person responsible for keeping the house clean, cooking for everybody, collecting water, etc.? It is the woman of the family. She may or may not be helped by others present in the family. It is a good practice to involve everybody in the house work specially at a time when she is working outside the home, sick or going to be a mother.

Fig. 21.6

Safe Motherhood

The safe motherhood initiative is a worldwide effort to reduce maternal mortality (death of the mother) or morbidity (ill health) during pregnancy and childbirth. Do you know that our country is one of those places in the world where highest number of maternal deaths occur? In North America, if 4,000 women are pregnant only one woman may die. In India if 132 women are pregnant, one of them may die. Could underdevelopment be the cause of these unwanted deaths? From the age of around 14 years to around 45 years women may get pregnant. Getting pregnant is a natural process. Pregnancy and childbirth may not always remain as natural and easy as everyone expects. All over the world about 6,00,000 women die yearly of pregnancy and childbirth related problems. In India a total of about 1,00,000 women die of pregnancy and childbirth related problems every year. Many more than this number suffer from some permanent damage. Safe motherhood teaches us about ways to reduce maternal and neonatal (mother and newborn baby) mortality and morbidity.

Women should know the following to ensure safe motherhood

i) Avoiding early or late pregnancy - Pregnancy must be avoided before 18 years and after 35-37 years as it is unsafe for both the mother and the child's health.

ii) Planning the family - This means that there should be a gap of more than two years between two pregnancies so that the mother's body gets time to recover. The child also gets proper care and attention during this time. Planning the family also means restricting the number of children in a family to two or three.

Any one of the following methods can be used to plan one's family. These are called methods of contraception.

- Natural methods - In the Rhythm method, sexual contact is restricted to the safe period of females and in the Coitus Interruptus method, the penis is withdrawn from the vagina before ejaculation. These are not very safe methods and may result in an unwanted pregnancy. The safe period can be calculated with the help of the doctor at your nearest Health Center.
- Mechanical methods -
  - Used by males: The condom (a thin rubber tube) worn over the penis prevents the sperms from entering the vagina after ejaculation. Condoms are available at a chemist's shop.
  - Used by females - The diaphragm or the intra-utrine device (IUD) are devices inserted into the vagina by a doctor. They prevent a pregnancy from occurring. IUD is commonly known as Copper T.
  - Chemical methods - These are in the form of sperm killing cream/jelly which are applied in the vagina. They are also available as oral contraceptive pills which have to be taken daily by the females.
- Surgical methods - These are methods of sterilization and are permanent in nature. In Vasectomy (for males) the vas deferens is cut and tied at both ends. In tubectomy (for females) the fallopian tubes are cut and tied at both ends.

iii) Care during pregnancy - It is extremely important to take adequate care of the woman during pregnancy, delivery and childbirth. The following precautions must be taken for safe motherhood.

Precautions to be taken for safe motherhood

- A qualified nurse/doctor must be consulted for care during pregnancy and for prepations for the type of delivery to be expected.
- Presence of a person skilled at normal deliveries is important at the time of delivery. She must also know when to refer this woman to a

For Extra Information log on to:
http://www. safemotherhood.org

hospital where blood transfusion and surgical procedure can be carried out if necessary.

- The newborn baby must be kept clean. The umbilical cord must be cut and tied, then kept clean so that bacteria cannot enter.
- Breast feeding must be started as soon as possible because early breast-milk gives natural immunity to the child. Also, dirty bottles may cause infection and diarrhoea.

INTEXT QUESTIONS 21.7

1. From the following cross out all those which do not help in transmission of HIV infection.

   (i) blood, semen and vaginal fluid

   (ii) shaking hands with infected person

   (iii) needles and blades used for piercing or inscisions

   (iv) mother to child before or at the time of birth

   (v) sleeping in the room where infected person sleeps

   (vi) kissing or hugging the infected person

   (vii) transfusion of blood from infected person

   (viii) having unprotected sex with infected partner

   (ix) sharing clothes of an infected person

   (x) playing with an infected person

2. Select the most suitable answer to complete the following statements, from the four given.

(i) The antibodies for HIV infection develop in the blood of an infected person in

   (a) 3 months

   (b) 2 weeks

   (c) 2 weeks to 3 months

   (d) 3 weeks to 10 years

(ii) The symptoms of AIDS may appear in a HIV positive person in

   (a) 2 weeks

(b) 3 months

(c) 3-4 months

(d) 10 years

(iii) A sure way to say that a person is HIV positive is when he/she

(a) shows severe weight loss

(b) suffers from fever for several weeks

(c) has persistent diarrhea

(d) shows antibodies in blood

(iv) AIDS is caused by HIV which damages the

(a) immune system of the body

(b) circulatory system of the body

(c) capacity of individual to make blood

(d) capacity of individual to make antibodies in the blood.

(v) Safe motherhood means

(a) to reduce maternal mortality and morbidity

(b) to deliver a baby alive

(c) to raise healthy children

(d) to look after the mother's health

(vi) Which of the following is not a precaution for safe motherhood?

(a) consultation with a trained nurse/doctor during pregnancy

(b) presence of a skilled person during delivery

(c) testing the sex of the unborn child

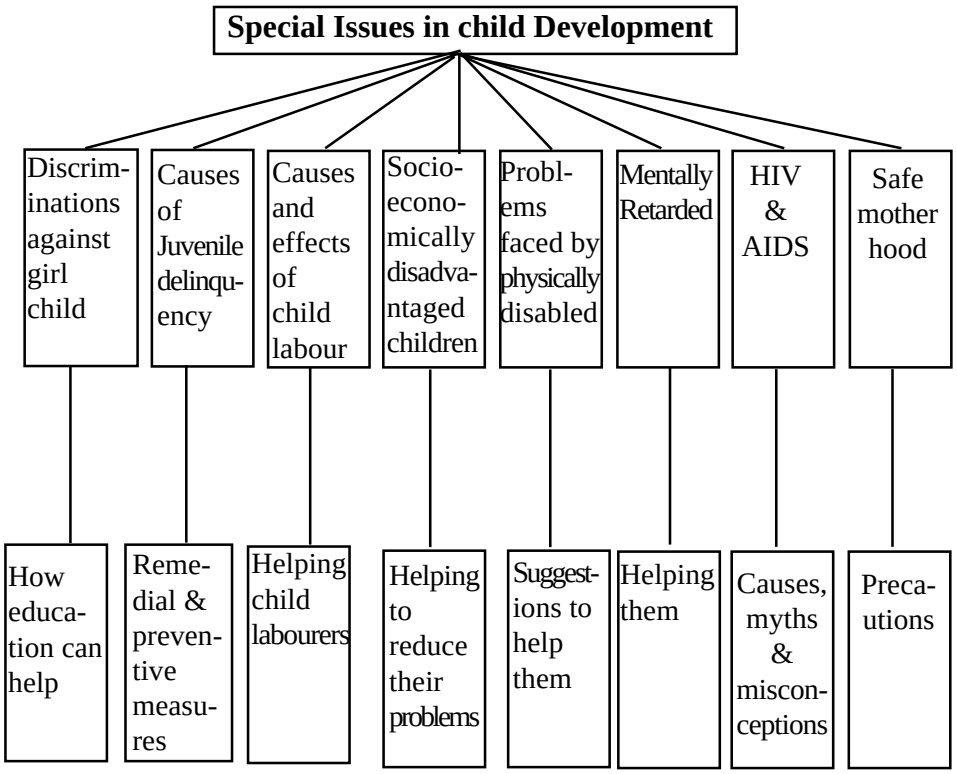
(d) safe cutting and tying of umbilical cord

3. Write the full form for AIDS and HIV.

.....

.....

WHAT YOU HAVE LEARNT



TERMINAL EXERCISE

1. List various discriminations against the girl child and discuss any one of them in detail.
2. Discuss the role of education in enhancing the status of the girl child.
3. Define juvenile delinquency and enumerate its causes.
4. What preventive measures can be taken for dealing with the problem of juvenile delinquency?
5. Define 'Child Labour' and list its causes.
6. Throw some light on the consequenses of child labour.
7. Suggest methods of dealing with the problems of child labour.
8. Define 'socio economically disadvantaged children' and suggest some ways of reducing their problems.
9. List some major physical disabilities in children and describe the problems faced by them.
10. Suggest some ways in which you can help disabled children.

11. Define mental retardation and suggest ways of helping mentally retarded children.
12. Define 'AIDS' and 'HIV'.
13. What are the 'Myths' and 'Misconecptions' regarding 'AIDS'.
14. Write a note on safe motherhood.

ANSWERS TO INTEXT QUESTIONS

21.1 Refer to text

21.2 Refer to text

21.3 Refer to text

21.4

i)	Teach	ii)	Donate, toys	iii)	Books
iv)	skills	v)	hygenic	vi)	educational
vii)	nutritious	viii)	craft	ix)	morals
x)	school.				

21.5

1.	(d)	2.	(c)	3.	(b)
4.	(b)	5.	(b)		

21.6

1.	(d)	2.	(d)	3.	(e)

21.7 Refer to text

AUDIO - Missing girl child in India.

VIDEO - Agle janam mohe bitiya na kijo/Aparna ka janam.

321en22

22

INTRODUCTION TO FABRIC SCIENCE

Clothes are as important as food and shelter. You use them for covering, protecting and even decorating yourself. You must be having different types of clothes for different occassions like your casual attire, office wear, party dresses, your night suit and so on.

Clothes are made from fabrics and today many types of fabrics are available in the market. Do you know what these fabrics are and how they are made? How do they come in so many different varieties? Why do some fabrics shine more than the others? Why are some fabrics light in weight whereas others are heavy? In this lesson you will find answers to these and many other related questions.

OBJECTIVES

After studying this lesson you will be able to:

- state the meaning and establish the scope of fabric science;
- define the term fibre and classify fibres according to their origin and length;
- explain the properties and uses of different types of fibres and;
- identify a fibre type by means of a physical test.

22.1 SCOPE OF FABRIC SCIENCE

Just look around you and pinpoint all the fabrics in your room. You will find that you are not only wearing a fabric, but also sitting on it and perhaps, have a piece of fabric hanging on the wall as a wall hanging or as curtains on the doors. This

means that fabrics not only make your clothes but are also used at home and outside. Can you think of some more uses of fabric? Yes, you are right. Some of the other uses of fabrics at home are in the kitchen as napkins, in the bathroom as towels, on the beds, sofas, and even on our floors as carpets. Fabrics also offer many uses in industry, medical field and even in automobiles.

What is a fabric?

A fabric is any piece of cloth.

A study of all the aspects of a fabric is called fabric science and it explains the behaviour of a fabric under different conditions.

You must have realised that different fabrics are not only different in their appearance but also in their properties, uses and their care procedures. Silk is smooth and shiny, cotton is smooth but dull. Wool is rough, but keeps you warm and cotton is cool to wear. Cotton can be washed easily but needs to be ironed after washing for a neat look. Nylon and polyester also are washed very easily and need almost no ironing after washing. Silk is either dry cleaned or washed with gentle soaps. These and many more concepts of fabrics are explained in fabric science. The market today is flooded with variety of fabrics in all types of colours, textures and designs. They all vary in their price range as well. To be an intelligent consumer, an exposure to fabric science is important as it helps us to understand a fabric better.

22.2 FIBRE

Have you ever wondered what makes a fabric? Find out yourself. Pull out a thread from a fabric and then open it out. You will find that this thread is made of small hair like strands twisted together. This single hair like strand is called a fibre. In other words, the **basic unit of a fabric is a fibre.**

22.2.1 Classification of Fibres

1. Fibres come as short fibres and long fibres and their length is an important property of fibres. To see a short fibre, take a ball of cotton and pull out fibres from it. Notice that these fibres are quite small. Now try and pull out fibres from a nylon fabric. These, you will see, are longer fibres. The short fibres are called **staple** and the long ones are called **filament**.

2. Fibres also can be classified according to their origin. Some fibres are obtained from natural sources i.e. from plants, animals or minerals. These are called **natural fibres**.The other fibres are **manmade.**

a) Natural Fibres :– There can be vegetables fibres, animal fibres and mineral fibers. Let us study these in detail.

(i) Vegetable Fibres

Fibres that come from plants are called vegetable fibres and can be obtained from different parts of a plant. You must have seen the white cotton fibres growing on plants. These are the seed hair fibres. Cotton is an example of seed hair. Similarly, fibres can be obtained from the stem of a plant e.g. jute and flax, and from the leaves like pineapple fibres. Fibres are also obtained from the outer covering of a fruit, like coir from coconut husk. All the plant fibres are made up of cellulose.

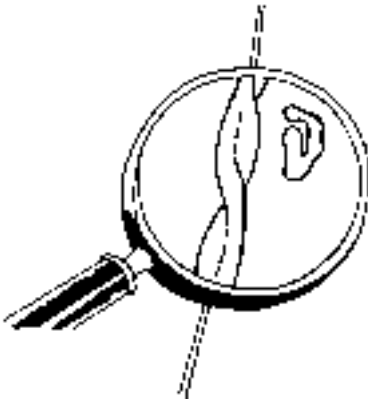


Fig. 22.1 : Vegetable Fibres-Cotton

(ii) *Animal Fibres*

Can you name the animals which give us fibres? Sheep is the most common animal whose hair is used as wool. Some other animals are camel, goat, and rabbit. Silk is also an animal fibre. It is the secretion of an insect called the silkworm. Do you know that silk is the strongest natural fibre? The animal fibres are made up of proteins.

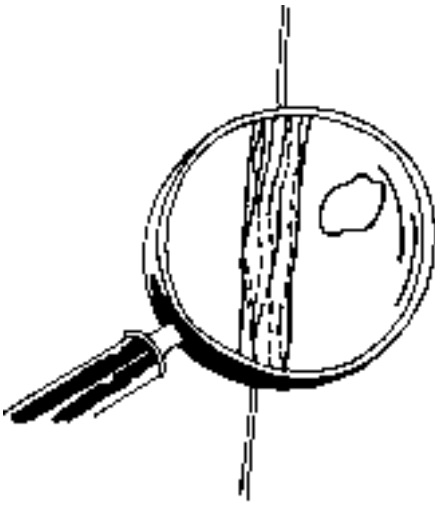


Fig. 22.2 : Animal Fibres - Silk

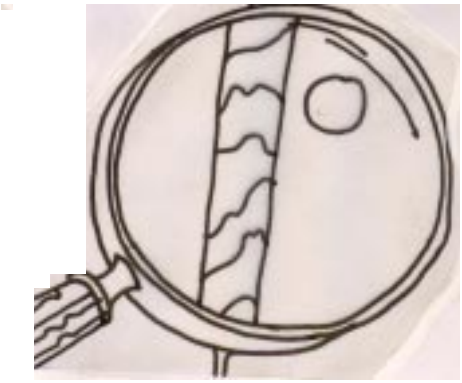


Fig. 22.3: Animal Fibres - Wool

(iii) Mineral Fibres

Natural fibres obtained from the minerals are called mineral fibres, eg. asbestos. You must have seen sheets of asbestos being used as rooftops. Can you think of other uses of asbestos? It is used by firefighters as clothes because it is fireproof.

Natural fibres are usually staple fibres with the exception of silk which is a filament fibre.

(b) Manmade Fibres There is another class of fibres called the manmade fibres. As the name suggests these fibres are not obtained directly from nature but made by using chemicals. Manmade fibres are of two types:

1. Regenerated fibres
2. Synthetic fibres

Let us find out more about man-made fibres.

(i) Regenerated fibres

These are made from natural raw material eg., cellulose, (waste cotton fibres or wood pulp) or protein depending upon the fibre to be made. This natural raw material is regenerated with the help of chemicals. Rayon is a regenerated cellulose fibre.

(ii) Synthetic fibres

On the other hand Synthetic fibres are obtained from chemical substances and are totally synthetic in nature, e.g., Nylon, Polyester, Acrylic (Cashmilon). Manmade fibres are generally filament fibres. Of course, they can always be cut in to small pieces to form staple fibre, if required.

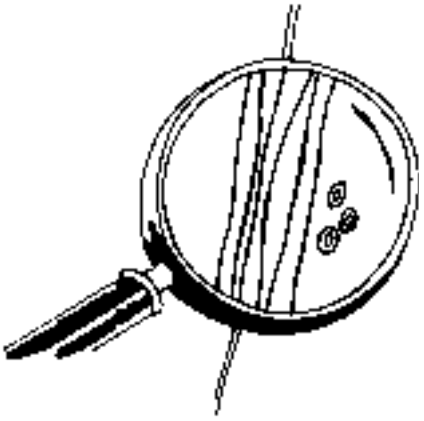


Fig. 22.4: Manmade synthetic fibres Polyester

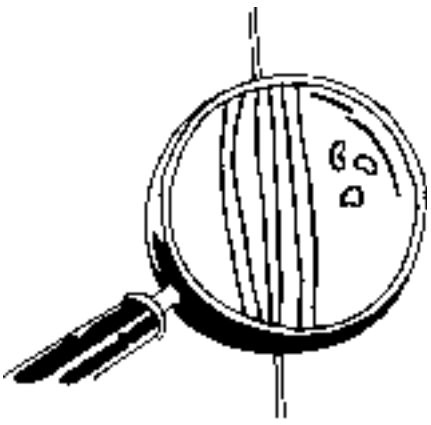
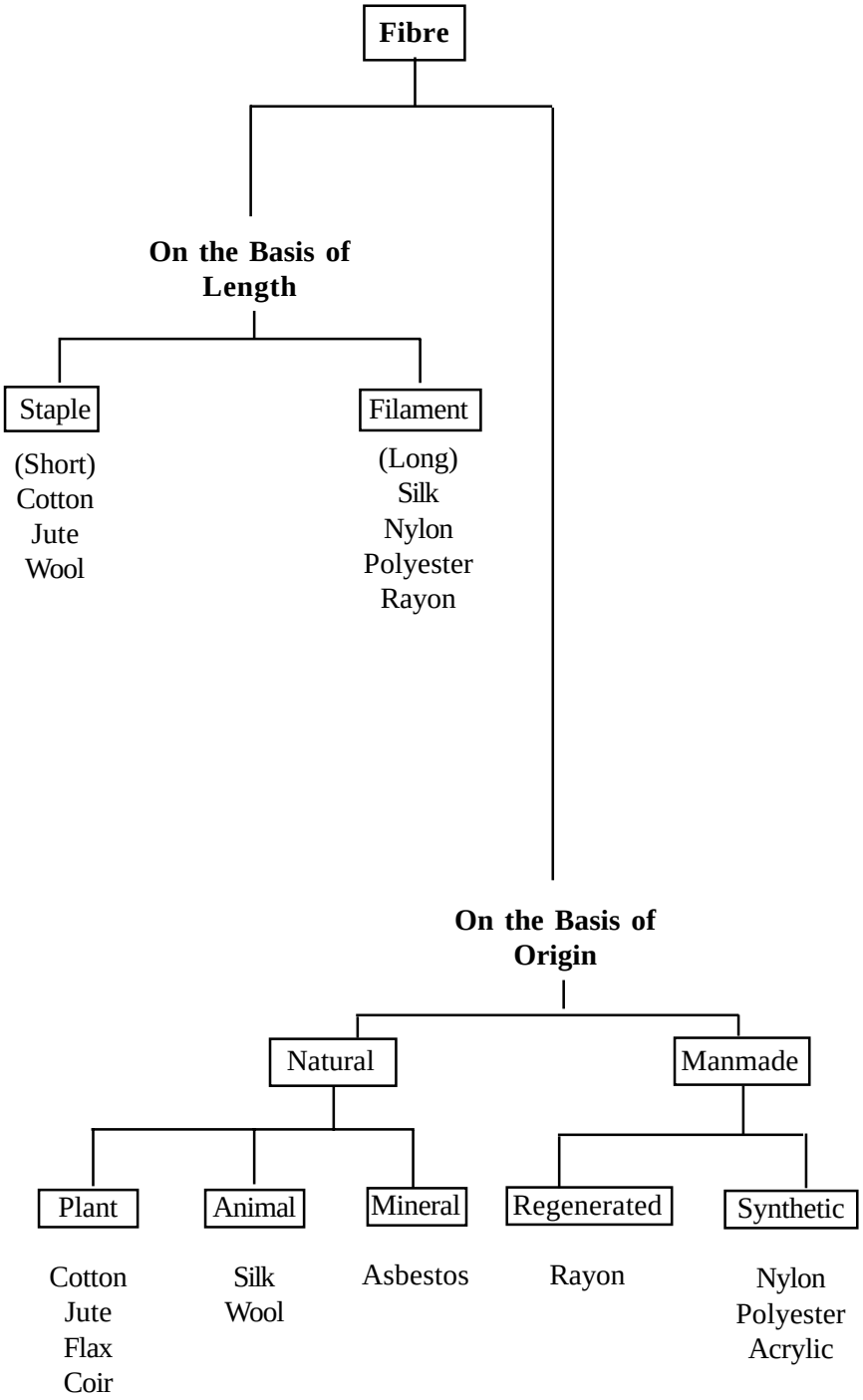


Fig. 22.5: Manmade synthetic fibres Acrylic

Let us put the two classifications together:



INTEXT QUESTIONS 22.1

1. The missing words in the following sentences are hidden in the wonder box. The words are written downwards, across and sideways. Find and encircle these words and complete the sentence.

WONDER BOX

X	S	Y	Z	B	A	C	E	G	R
B	Y	F	D	U	F	H	J	L	E
A	N	A	l	l	Y	A	A	H	G
S	T	A	P	L	E	C	S	H	E
E	H	N	N	D	A	D	H	H	N
E	E	I	S	I	O	M	E	M	E
D	T	M	E	N	N	O	E	A	R
H	I	A	E	G	A	H	P	N	A
A	C	L	M	B	A	K	Y	M	T
I	Y	O	C	L	O	T	H	A	E
R	G	O	A	O	A	S	H	D	D
A	M	D	U	C	O	C	Q	E	R
R	P	A	A	K	G	T	R	Y	A
B	S	R	T	S	E	I	A	K	D

a) A fabric is any piece of _____

b) Short fibres are called _____ and long fibres are called _____.

c) Fibres are the _____ _____ of a fabric.

d) Fibres can be classified into natural and _____

e) Manmade fibres can be _____ or synthetic.

f) Wool is a _____ fibre obtained from _____.

g) Polyester is a _____ fibre.

h) Cotton comes from the _____ of a plant.

2. Match column A with column B

A	B
a) Rayon	i) Synthetic fibre
b) Cotton	ii) Stem fibre
c) Silk	iii) Regenerated fibre
d) Nylon	iv) Natural cellulosic fibre
e) Wool	v) Leaf fibre
f) Jute	vi) Animal fibre
g) Asbestos	vii) Animal secretion
	viii) Mineral fibre

22.3 PROPERTIES OF FIBRES

Table 22.1 : Properties of fibre

Characteristics	Cotton	Wool	Silk	Rayon	Nylon	Polyester	Acrylic (Cashmilion)
1. Length of the fibre	Fabric is made up of staple fibres as rayon.	It is staple fibre, generally coarser fabrics like blankets, etc., are made. Fabric like suit length is made of longer fabres.	longest of all natural fibres.	It is filament fibre and filament fibre, so can be attained in any desired length.	It is a man-made,	Same as rayon.	Same as rayon. Same
2. Appearance	It is a dull fibre so gets dirty quickly.	Dull, wavy and rough fibre.	Smooth, shiny and straight so sheds soil and dirt easily. It does not look dirty even after many wears.	Its appearance is smooth and shiny so sheds dirt easily.	Smooth and shiny, so resistant to dirt and easy to wash.	Smooth surface so does not absorb stains and can be washed easily.	Wool appearance, but lighter in weight.
3. Moisture absorption	Cotton absorbs moisture easily and also dries up quickly. So it is useful for towels and wiping cloths. It can absorb perspiration from the body and because it also dries up quickly, it does not stick to the body and gives a cooling effect. It is suitable for summer wear and undergarments.	It is somewhat water repellent in nature. However, the fibre can absorb large quantities of water. They do not dry up quickly and can hold high amount of moisture without feeling damp.	Can absorb large amount of water, without feeling damp.	Like cotton, absorbs moisture readily and also dries up fast.	Does not absorb moisture easily. It is also warm to wear and does not absorb perpiration.	Absorbs least amount of moisture compared to other fibres. Garments appear uncomfortable in not absorb perspiration.	Does not absorb moisture easily-this makes it difficult to dye the fiber. summer because it does
4. Heat Conduction	Good conductor, i.e. conducts the heat away from the body and keeps it cool.	Bad conductor of heat, therefore conserves body heat and keeps it warm.	Poor conductor of heat making it a warm fabric. Due to smooth surface, unlike wool it cannot provide good insultation.	Good conductor of heat and therefore cool to wear, though not as cool as cotton.	Poor conductor of heat.	Poor conductor of heat.	Poor conductor of heat. Therefore it is warm to wear.
5. Strength	Stronger when wet so can be rubbed hard without and damage while washing.	Weak fibre, becomes, weaker when it is wet, therefore can be damaged if it is rubbed hard during washing.	Though it appears delicate, it is a very strong fibre, it loses strength when wet.	It loses strength when wet, should not be rubbed hard.	Strongest among all fibres. Excellent resistance to rubbing, does not lose any strength when wet, so is important for industrial use.	Extremely strong fibre, although not as strong as nylon.	Satisfactory strength both when dry and wet. Its strength is not as high as nylon and polyester but adequate for many uses in apparel and home furnishings.
6. Resillience Good reasistence to (resistance of a fabric to wrinkling and creasing)	Wrinkles and creases readily during use. After washing these wrinkles need to be ironed out.	A flexible and pliable fibre, readily springs back to shape after crushing or creasing.	The creases hang out well. But not as quickly and completely as in wool. Needs ironing after washing.	Wrinkles and creases very easily.	recovery from creasing and wrinkling requires little ironing, after washing.	Shows very good from creasing and wrinkling. It requires little or no ironing after washing.	Shows excellent recovery wrinkling and creasing.
7. Uses used for carry bags, fishing	Summer wear-shirting, suitings, sportswear and undergarments, sheets, curtain and wiping cloth making blankets, carpets like napkins, towels.	Winter wear-knitted into sweaters, gloves, caps, suitings, material &fabric for coats, blankets, carpets and home furnishing.	Considered a high value fabric. Used as sarees, dress material, suitings,	Summer wear dress materials. Being slippery it is used as men's ties, scarves, etc. jackets. Also used in carpets, and home furnishings.	Used in hosiery items like socks, dress materials and sweaters. Due to high lining for heavy coats and ropes and tyre cords. Also used in carpets and home furnishings.	Dress materials for both men and women. Used for making ropes, nets, etc., used at home for home furnishings.	Winter wear, very popular substitute for wool; for sportwear, also strength, used for making and furnishing fabrics.

22.4 IDENTIFICATION OF FIBRES

The vast variety of fabrics available today, makes their identification important. You know that variety is created by using different fibres in combination. Knowledge of the fibre content of a fabric is therefore necessary to know its suitability, use and care. Sometimes you may have been cheated by an imitation fibre, like a fabric looking like silk but turning out to be artificial silk or imitation silk. Labels and salespersons are not always able to guide you.

Burning test is a simple and reliable test and can be done alongwith the visual inspection of the fabric. It can help you to choose the fabric according to your requirements. The burning test does not identify the fibre in particular but indicates its group. Cotton, flax and rayon will have similar results when burnt as they are all basically cellulosic in nature.

a) Visual Inspection

You can identify a fabric by its appearance but accuracy in identifying comes through experience. The appearance properties of different fibres given earlier in this lesson can help you in identifying a fabric e.g., Silk is smooth, shiny and fine. Cotton is also smooth but looks dull, wool is most definitely rough.

b) Burning Test

To conduct the burning test, take a small piece of fabric (2 x 2cm) and hold it with a pair of forceps. Then do the following :

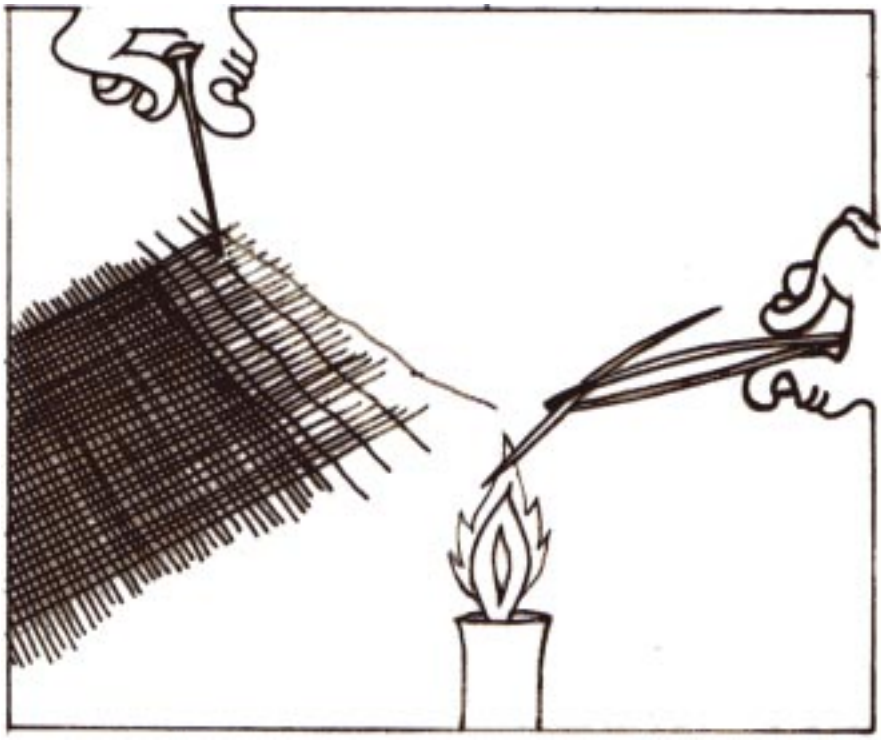


Fig. 22.6

Table 22.2 : Burning Test of Fibres

Name	Approaching Flame	In Flame	Removed From Flame	Odour	Residue
(a) Natural Cellulose fibre– Cotton, Linen	Does not shrink away and catches fire on contact.	Burns quickly.	Continues burning, shows an afterglow.	Like burning paper.	Light, feathery, gray in colour.
Manmade cellulose fibre– Rayon	-do-	-do-	-do-	-do-	Light, fluffy very small amount.
Protein Fibre– Wool	Curls away from the flame.	Burns slowly.	Stops burning after removing from flame.	Like burning hair.	Small black bead, brittle, crushable.
Silk	-do-	Burns slowly and sputters in flame.	-do-	-do-	Bead-like, black, crushable.
(b) Manmade Synthetic– Polyester	Melts and shrinks away from the flame.	Burns slowly and melts.	-do-	Smell of chemicals.	Bead formed, hard, tough, black-brown in colour.
Nylon	-do-	-do-	-do-	Synthetic or chemical odour.	-do-
Acrylic	-do-	Burns quickly and sputters.	Continues to burn, melts and molten fibre drops.	Acidic (vinegar) odour	Irregular black beads, hard but crushable.

INTEXT QUESTIONS 22.2

1. Choose the correct answer. Give reasons for your choice.

   i) Which of the fabrics is most suitable for winters?

   a) Cotton b) Nylon c) Wool d) Polyester

Reason .....

.....

ii) Which is the strongest fibre?

a) Silk b) Nylon c) Acrylic d) Polyester

Reason .....

.....

iii) Which fabric will require least ironing after washing?

a) Cotton b) Rayon c) Silk d) Polyester

Reason .....

.....

iv) When cotton burns the odour is that of-

a) Burning paper b) Burning hair

c) Acid d) Chemical

Reason .....

.....

v) Synthetics, when brought near the flame will-

a) Curl away b) Melt and shrink

c) Catch fire but not melt d) Remain unaffected.

Reason .....

.....

vi) Residue of burnt rayon is

a) Hard bead-like, not crushable

b) Crushable bead-like

c) Light grey, feathery

d) Fluffy, small amount.

Reason .....

.....

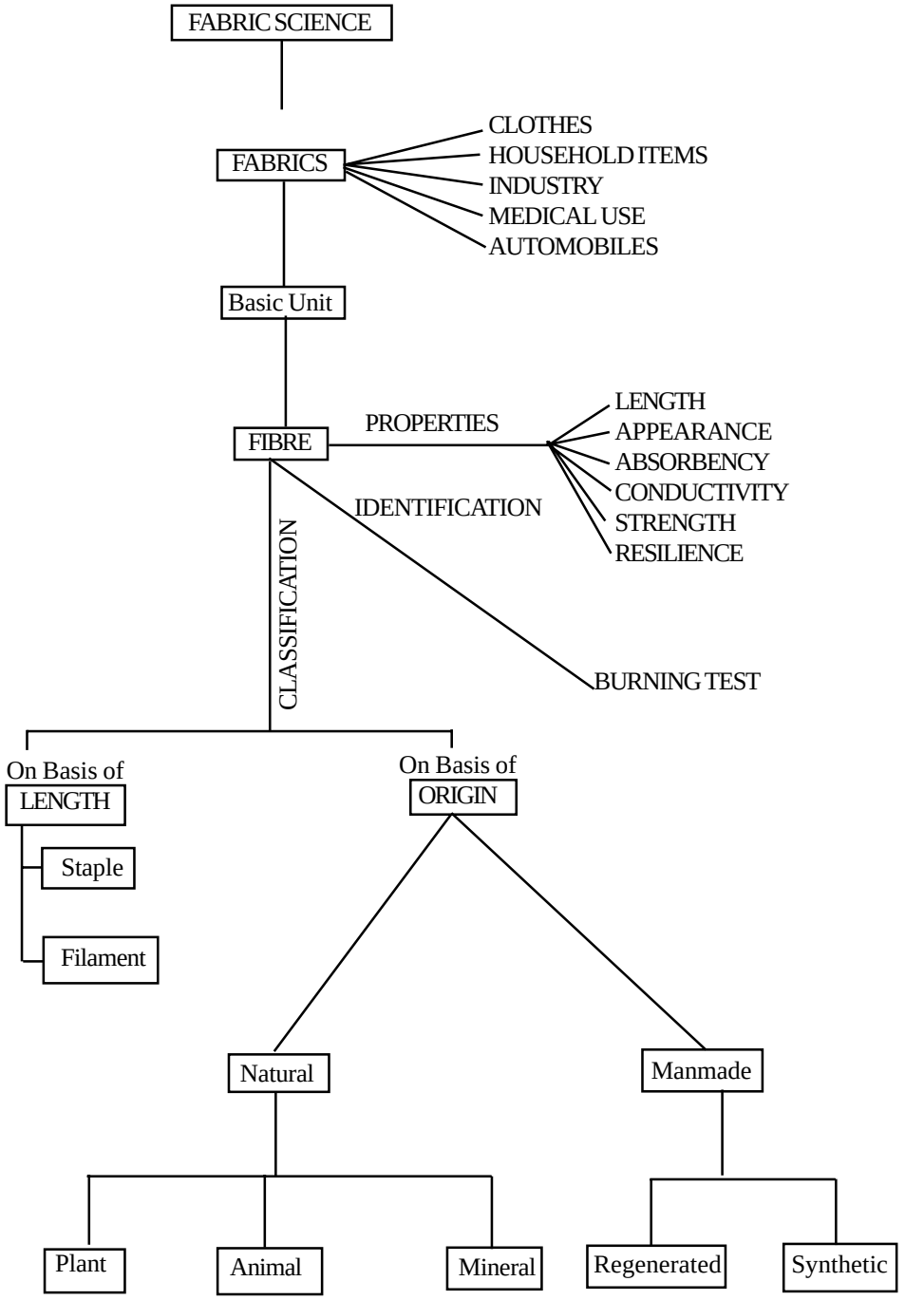
3. Give Reasons

i) Cotton is suitable for summer wear and undergarments.

ii) Nylon is used for making ropes

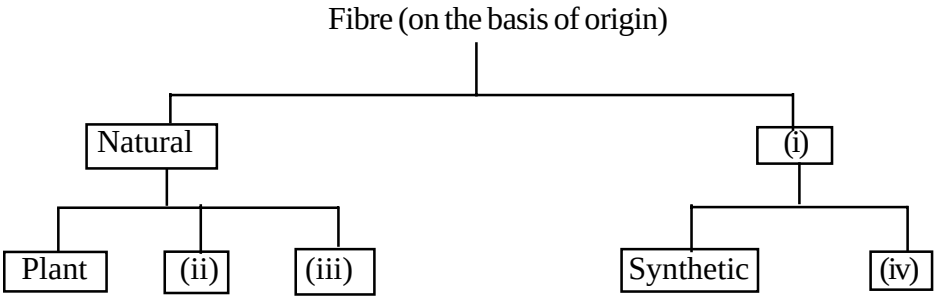
iii) Nylon garments are uncomfortable in summers.

WHAT YOU HAVE LEARNT



TERMINAL EXERCISES

1. Define a fabric and elaborate on its various uses.
2. Classify fibres on the basis of their origin.
3. Name the fabric which is suitable for summer wear and state its important properties.
4. How will you identify a rayon fibre?
5. Distinguish between natural and manmade fibres.
6. Complete the following flow chart:-



ANSWERS TO INTEXT QUESTIONS

22.1

WONDER BOX

X	S	Y	Z	B	A	C	E	G	R
B	Y	F	D	U	F	H	J	L	E
A	N	A	l	l	Y	A	A	H	G
S	T	A	P	L	E	C	S	H	E
E	H	N	N	D	A	D	H	H	N
E	E	I	S	I	O	M	E	M	E
D	T	M	E	N	N	O	E	A	R
H	I	A	E	G	A	H	P	N	A
A	C	L	M	B	A	K	Y	M	T
I	Y	O	C	L	O	T	H	A	E
R	G	O	A	O	A	S	H	D	D
A	M	D	U	C	O	C	Q	E	R
R	P	A	A	K	G	T	R	Y	A
B	S	R	T	S	E	I	A	K	D

2. a) and (iii)
   b) and (iv)
   c) and (vii)
   d) and (i)
   e) and (vi)
   f) and (ii)
   g) and (viii)

3. (i) Manmade (ii) Animal (iii) Mineral (iv) Regenerated

22.2

1. i) c, because wool is bad conductior of heat
   ii) b, because it has excellent resistance to rubbing and does not lose strength when wet
   iii) d, because it has excellent recovery from creasing and wrinkling
   iv) a, because it is cellulosic in nature
   v) b, because it is made up of chemicals
   vi) d, because it has cellulose as its raw material

2. i. It is cool and absorbant.
   ii. It is the strongest fibre.
   iii. Nylon does not absorb moisture.

For more information

Log on to http:// www.fabriclink.com/fabriccare.html

23

321en23

YARN AND ITS CONSTRUCTION

In the last lesson you have learnt that the basic unit of a fabric is fibre. Fibres are either staple or filament. The fibre, specially staple, is too weak to make a fabric. The treatment given to a fibre before it can be made into fabric, is discussed in this chapter.

OBJECTIVES

After studying this lesson you will be able to:

- define a yarn;
- explain the process of yarn making:
- elaborate the meaning and importance of blended yarn and cite examples of blends available;
- describe the yarn properties;
- state and classify the different types of yarn and their uses; and
- differentiate between a yarn and a thread.

23.1 YARN

You must have seen your mother knitting a sweater or you must have knitted one yourself. For this you use a long thread of wool. Untwist the thread and observe the waves. You will find that it is made of a bundle of small fibres. This thread made of fibres is called a yarn. Twisting the fibres gives the yarn length and strength. A yarn can either be a spun yarn (from staple fibres) or a filament yarn (from filament fibres). Can you now define a yarn? Yes you are right!

Yarn is an assemblage of fibres twisted together.

Both, staple and filament fibres are used to make yarn.

Staple fibres make spun yarn and filament fibres make filament yarns.

23.1.1 Yarn Making

Process of making yarn from fibres is called spinning.

i) ***For making yarn from staple fibres*** - A bundle of fibres is taken, cleaned and straightened. After this they are pulled out and drawn and a twist is given to hold them together. This type of spinning is called mechanical spinning and is done for natural fibres like cotton and wool. The resultant yarn is a spun yarn.

You can try and make a yarn yourself. Take a ball of cotton and start pulling a few fibres, while pulling also twist the fibres. You will see that a yarn emerges because a number of small fibres are getting twisted with each other. This process of pulling the fibres and twisting them together is called spinning. You can spin using a takli (spindle), charkha (spinning wheel) or a spinning machine.

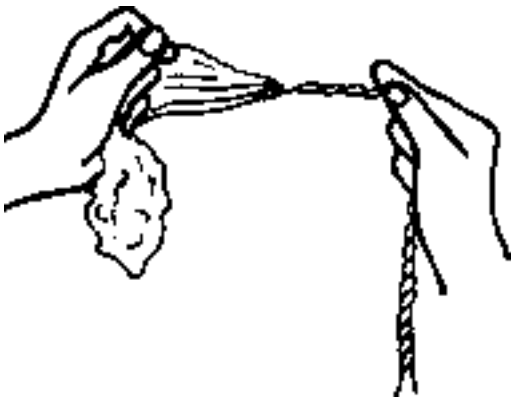


Fig. 23.1: Spinning by hand

ii) ***For making yarn from filament fibres*** - The filament yarns are spun by the chemical spinning process. To understand this recall how a *'halvai'* makes *'sevian'*. He makes a dough of *'besan'*, passes it through holes into hot oil, the *'besan'* takes the solid form of *'sevian'*. The chemical spinning process is similar to this. A spinning solution of the raw materials is made and passed through the holes of a spinnerette (looks like a bathroom shower). The solution solidifies into thread like form called the filament fibre. These filament fibres are twisted together to form a strong and fine yarn.

23.2 BLENDS

You must have heard names like terrycot and cotswool. These are names of mixed fabrics and are made from more than one type of fibre. At the time when the spinning of yarn is being done, two types of fibres are mixed, pulled and twisted together to form a blended yarn. Can you say why two fibres are mixed together? Yes, two fibres are mixed together so that we can get the good properties of both

in one fabric. Cotton fibre is mixed with terelene to get terycot. Terycot has the comfort property of cotton and is easy to maintain like nylon. Similarly, wool or silk fibres are mixed with terelene to produce terrywool and terrysilk respectively.

Table 23.1 Commonly Available Blended Fabrics

Fabric (Blend)	Composition		
Terrycot	Terylene	+	Cotton
Cotswool	Cotton	+	Wool
Terrywool	Terylene	+	Wool
Cotton Silk	Cotton	+	Silk
Woolacrylic	Wool	+	Acrylic

Activity 23.1

Visit your neighborhood cloth shop. Find out all the blends that are available Record your observations in your record book.

S.No.	Blends available	Composition

INTEXT QUESTIONS 23.1

1. Fill in the blanks using the letters in the treasure chest. Each letter can be used move than once.

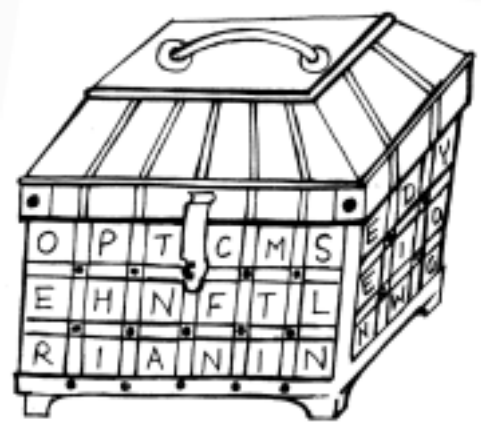


Fig. 23.2

i) Chemical spinning involves making a ..... solution, passing the solution through a ..... and ..... into fibre form.

ii) Spinning can be done using a spindle, ... or .....

iii) Spun yarns are made from ..... fibres and filament yarns from ..... fibres.

iv) Two types of blends are ..... and .....

23.3 YARN PROPERTIES

In the previous lesson we had discussed the properties of different fibres and how they influence the behaviour of fabrics. Properties of yarn also have an effect on the behaviour of the fabric.

The two important properties of a yarn are its *fineness* and the *amount of twist* it has. These two properties of the yarn are related to each other. More the twist in a yarn, the finer, smoother and stronger it is. Do you remember the exercise of making a yarn - the more you pull out the fibres and twist them, finer the yarn becomes.

However, if a yarn is highly twisted it gives the fabric a crinkled effect.

Such high twist yarns are called *crepe* yarns and are mainly used to make fabrics for dupattas.

23.4 TYPES OF YARNS

On the basis of their structure, yarns are broadly classified into three types:

i) Simple yarns ii) Complex/Novelty yarns iii) Textured yarns

i) Simple Yarns

A yarn which is smooth and uniform and evenly twisted is called a simple yarn. It is commonly used for making fabric like poplin and cambric. Simple yarns are further classified into three types.

A simple single yarn is an assemblage of fibres evenly twisted together.

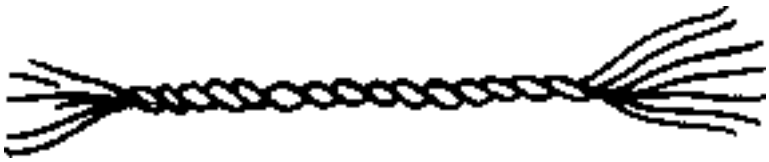


Fig. 23.3 : Simple single yarn

A Simple Ply yarn is made of two or more singles evenly twisted together. If the ply has two singles it is called a 2-ply and so on. This type of yarn is found

in a 2 by 2 rubia fabric. It has 2 ply yarns in both directions of the fabric.

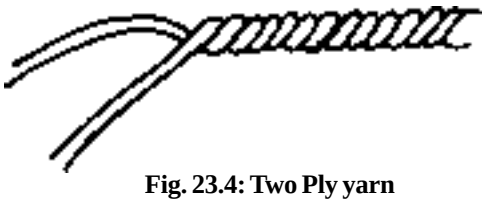


Fig. 23.4: Two Ply yarn

Similarly, 3 ply yarns or 4 ply yearns are also available.

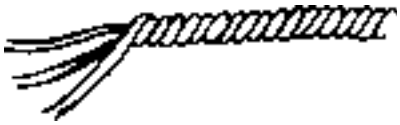


Fig. 23.5: Three Ply yarn

Fig. 23.6 : Four Ply yarn

A simple cord yarn is made of two or more ply yarns twisted together. To see a cord yarn, take a clothes line used for drying clothes and untwist it.

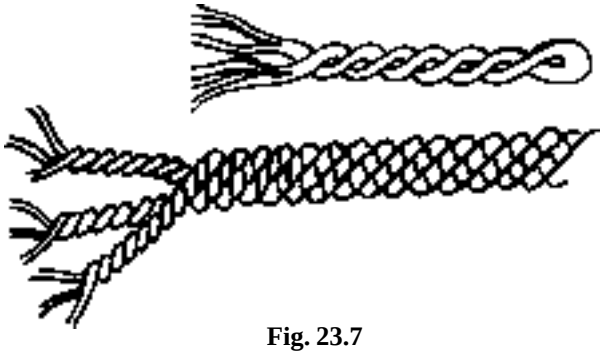


Fig. 23.7

Making a cord yarn : Take two or more ply yarns. Twist them together. It will make a cord yarn.

ii) Complex/Novelty Yarns

A yarn which makes a fabric is not always smooth and uniform. Just unravel a 'Khadi' fabric and see the yarns that make it. You will see that these yarns are not even, but are thick in some places and thin in the other. Such yarns are known as Complex yarns. Complex yarns are the uneven yarns which may be thick and thin or have curls, loops, twists and even differently coloured areas along their length. Due to this fancy look of the yarns they are used to add interesting effects in fabrics. Like simple yarns, the complex yarns may also be single or ply.

A single complex yarn is usually unevenly twisted to make it thick and thin in places. This is the type of yarn which is found in the 'Khadi' fabric.

Before discussing the complex ply yarns, recall that a ply yarn is made of two or more single evenly twisted yarns. In complex ply two or more complex yarns are twisted around each other to form loops, curls and knots to create fancy effects. Many knitting yarns are compex ply yarns which give interesting textures on sweaters.

Another type of yarn that you all must have seen is a Core yarn. Just pull out the elastic from one of your old socks. You will see that this elastic has been wrapped by another yarn of cotton or nylon. Such a yarn is called a Core Yarn and is classified as a Novelty Yarn. Some examples of complex and novelty yarns are illustrated below along with their descriptions.

Fig. 23.8 : (a) SLUB yarn with thick and thin places

Fig. 23.8: (b) SPIRA or GIMP- combination of soft, thick yarns twisted with fine, hard yarns

Fig. 23.8: (c) BOUCLE- two different yarns are fed into the loom at different speeds for a varied effect

Fig. 23.8: (d) LOOP – stiff fibres form loops which spring out of the core yarn

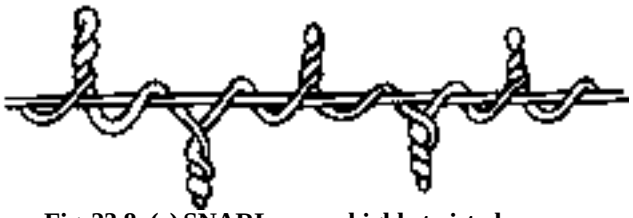


Fig. 23.8: (e) SNARL – very highly twisted yarn

Fig. 23.8 : (f) KNOP – ground yarn is held under tension as knops are built up a fast speed

Fig. 23.8 : (g) CHENILLE – a woven cut fabric yarn

iii) Textured Yarns

When you unravel a sweater, you find that the yarn which was straight when you knitted has now become curly. This yarn can now be called a textured yarn.

What is texturizing?

> Texturizing is a treatment usually given to a manmade filament, after which it becomes curly or acquires some forms of loops, coils or crimp.

Hence after being textured, a smooth filament will have any of the following textures:

Do you recall the properties of manmade filaments like nylon and polyester from the previous lesson? Yes, they are smooth, slippery, light in weight and have a low absorbency.

Hence fabrics made from simple filament yarns are uncomfortable to wear. When such filament yarns are textured they look denser, become bulky, and more stretchable. Due to their changed texture, spaces are created between yarn. This makes the fabric breath better and become more absorbent and therefore comfortable to wear.

To see a textured yarn, pull out a yarn from your nylon socks. You will see that this yarn is fluffy, soft, stretchable and looks denser than an ordinary nylon yarn.

Fig. 23.9 : (a) Coiled

Fig. 23.9 : (b) Peaked Crimped

Fig. 23.9 : (c) Rounded Crimped

Fig. 23.9: (d) Curled

Fig. 23.9 : (e) High bulk – stretched and relaxed

Thread and Yarn

You must have used the terms thread and yarn interchangeably many times. Actually a thread and yarn are similar but not the same. A yarn is processed further to make a thread.

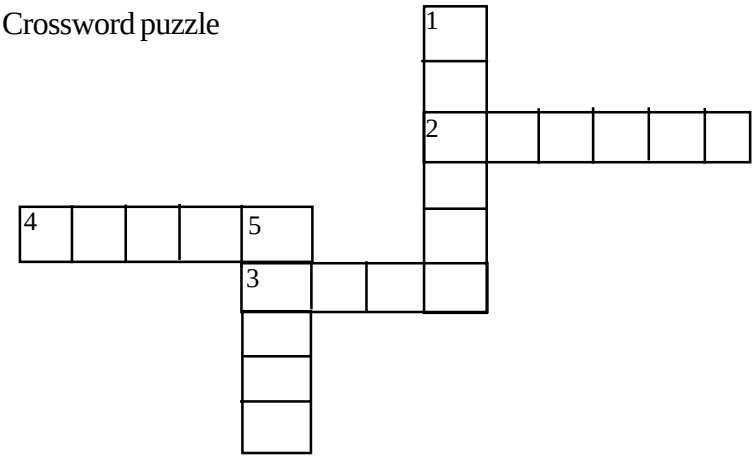
A thread is usually a ply yarn, it is finer, more even and stronger.

INTEXT QUESTION 23.2

1. Differentiate between the following–
   i) Single yarn and ply yarn.
   ii) Cord yarn and core yarn.
   iii) Complex yarn and Textured yarn.
   iv) Thread and yarn.

2. Justify the following statements giving examples where ever applicable.
   i) A high amount of twist brings in the crinkle effect in the yarn.
   ii) Complex yarns give fancy effects in fabrics.
   iii) Complex yarns are uneven in their diameter.
   iv) Thread is not the same as yarn.

3. Crossword puzzle



Clues:

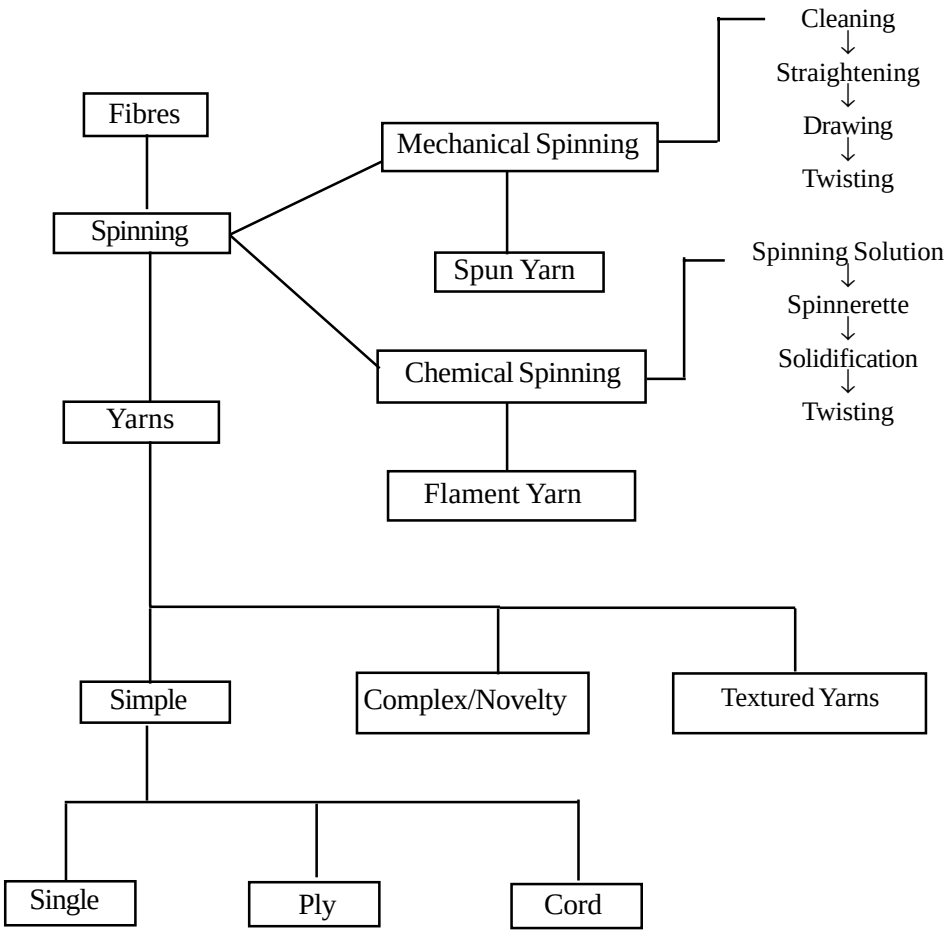
Down

1. Fibre good for undergarments
5. Strongest manmade fibre

Across

2. Strong, finely twisted yarn
3. Group of fibres
4. Manmade cellulosic fibre

WHAT YOU HAVE LEARNT



TERMINAL EXERCISES

1. How will you define a yarn?
2. Explain the process of making yarns from staple fibres.
3. Why are fabrics made from textured yarn more comfortable to wear?
4. Which additional properties make a yarn into a thread?
5. What kind of properties will you look for when you purchase “terewool fabric”?

ANSWERS TO INTEXT QUESTIONS

23.1 1 (i) spinning, spinnerette, solidifying.

(ii) Spinning wheel, spinning machine.

(iii) Staple, filament

(iv) Cotswool, terycot.

23.2 1. Refer to text

2. Refer to text

3. 1. cotton 2. thread 3. yarn 4. rayon 5.nylon.

AUDIO

Blends and their usefulness

VIDEO

A film on yarn making

For more information
http://www.fabriclink.com
http://www.allfiberarts.com/cs/dyeinfo.htm

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24

FABRIC CONSTRUCTION

When you see the clothes you wear or fabric you use for curtains or bedsheet, have you noticed something different in them? Some fabrics are thick, others are thin, some are plain, others have self-design and some are stiff and others limp. If you examine your clothes, you will find that your inner clothes or underwear are very different from outer clothes. These differences in fabrics are because of their construction. You have already learnt in the previous lessons that the fibers and yarns affect the properties, appearance, and wearability of the fabric. Similarly, fabric construction methods also influence the appearance, properties and performance of the fabric. In this lesson you will learn about this aspect of fabrics.

OBJECTIVE

After reading this lesson you will be able to:

- describe briefly the methods of fabric construction;
- explain the process of weaving and knitting;
- describe types of basic weaves;
- distinguish between woven and knitted fabrics.

24.1 WHAT IS A FABRIC?

In the earlier lesson you have learnt about fibres and yarns but still when you are asked about the meaning of textiles you think of fabrics, clothes or garments. Actually, in order to use the fibers and yarns for apparel and household textiles and other end uses, there is a need to convert them into a fabric.

Fabric is any piece of cloth

What do you see when you go to the market? The shops are full of different types of fabrics. Let us now see how a fabric is made or constructed.

How is fabric constructed?

Fabrics can be made or constructed by using a number of techniques as given below:

i) Weaving
ii) Knitting
iii) Non-woven
iv) Braided
v) Nets
vi) Laces

Now, let us enumerate some of the important features of these techniques.

i) Weaving : Weaving is the most commonly used method of fabric construction. You must have seen a chatai being made. Weaving is similar to it, where two sets of yarns are interlaced with one another at right angles. Weaving gives a firm fabric. Have you heard of fabrics like poplin, denim and cambric? Yes, these are available in all the cloth shops and you must have used them to make your garments.

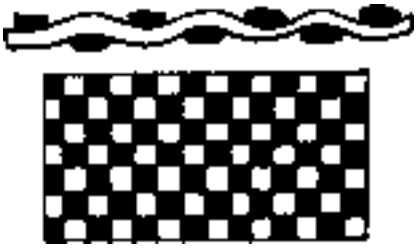

Fig. 24.1: Weaving

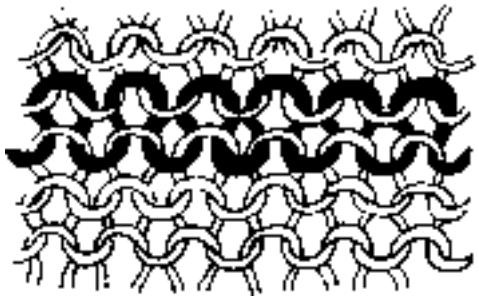

Fig. 24.2: Knitting

ii) Knitting : When you knit a sweater, there is normally one ball of yarn which is interlooped to get a fabric. This technique is called knitting and it gives a lot of stretch and easy-care properties to fabric. Knits are mainly used for hosiery. Knit fabrics are specially useful for garments like underwear, T-shirts, socks etc.

iii) Non-Woven: These fabrics are made directly from fibers without weaving or knitting. Fibers are held together by mechanical forces, gum or heat. Namada is a traditional Kashmiri piece of a non-woven type of fabric.

iv) Braided Fabrics: Braided fabrics are created in a fashion similar to braiding of hair. These fabrics are mainly used to make trimmings and shoe laces.

Fig. 24.3: Braided Fabric

v) **Nets:** They are open-mesh fabrics with geometrical shapes. These yarns may be knotted at the point of intersection. You notice it being used very commonly for mosquito nets.

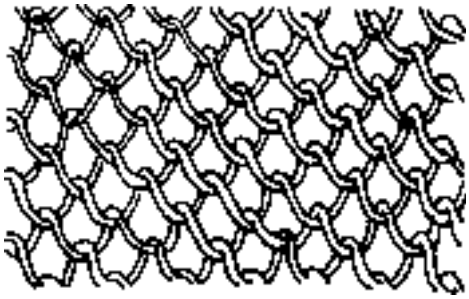

Fig. 24.4: Net

vi) **Laces:** Yarns are criss-crossed to create intricate designs. Yarns may be interlooped, interlaced or knotted to give open-mesh structure. Beautiful decorative designs can be created through lace making. Laces are very important trimmings that are used to decorate a garment.

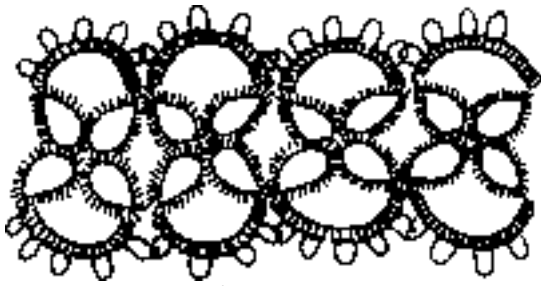

Fig. 24.5: Lace

Activity: 24.1 Collect one sample each of woven knitted, non-woven, braided, net and lace fabrics. A trip to your neighbourhood tailor will be very helpful in collecting these samples. Stick these samples in your record book and note down the observations as per the example. This exercise will enable you to choose the appropriate fabric for a specific use.

S.No	Sample	Name	Commonly used for making the following articles.
1.		Net	mosquite net, frock, lehngas, dupattas etc

INTEXT QUESTIONS 24.1

Q1. Identify the following methods of fabric construction:

i)

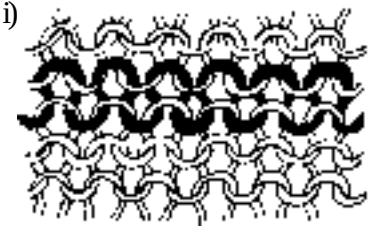

Fig. 24.6

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ii)

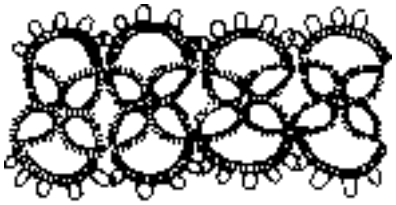

Fig. 24.7

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iii)

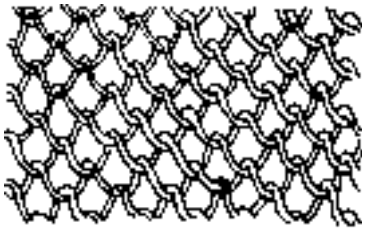

Fig. 24.8

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iv)

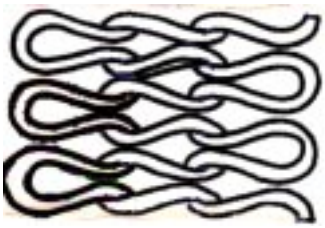

Fig. 24.9

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24.2 WHAT IS WEAVING?

In weaving two sets of yarns are interlaced at right angle to one another in an established sequence.

Have you ever seen a 'charpai' being made? On the frame, first one rope is taken and interlooped on two parallel edges and after that a second rope is interlaced perpendicular to it going once over the rope and once under it. This kind of an interlacement gives an even check effect and the weave is quite firm.

The weaving of a fabric is also done in a similar way, except for the fact that yarns are used for interlacing and a loom is used to hold the thread instead of a frame. There are some terms which are frequently used, you see them on the lable also.

Selvedge: When you examine a fabric, you see two long finished edges, one on each side along the length of the fabric. These edges are called selvedge and give strength to the edges which is important in further processing of the fabric.

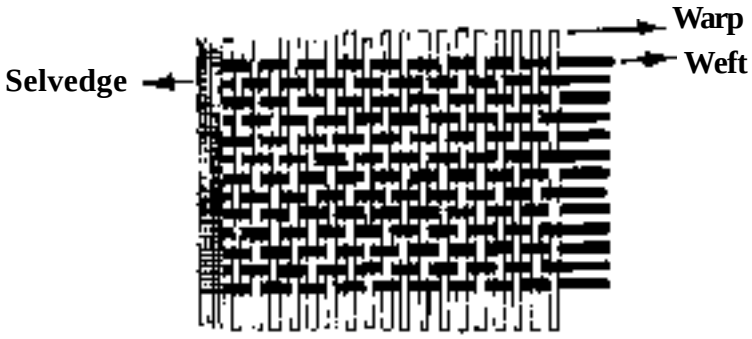


Fig. 24.10 Common terms in textiles

Warp: They are the yarns along the length of the fabrics or parallel to the selvedge. They are also called ends.

Weft: When you see a woven fabric, besides warps, another set of yarns move perpendicular to warps. They are called wefts. They are interlaced with warps in a crosswise direction to make a fabric. They are also called picks or fillings.

Thread Count: You must have noticed that some woven fabrics look dense and compact whereas others open. This difference is due to the thread count which refers to the total number of warps and wefts per square inch of a woven fabric. Thread count tells us about the fabric quality and durability. Fabric with a higher thread count is better than fabric with lower thread count. Also, for good quality fabric, warps and wefts should be more or less equal in number.

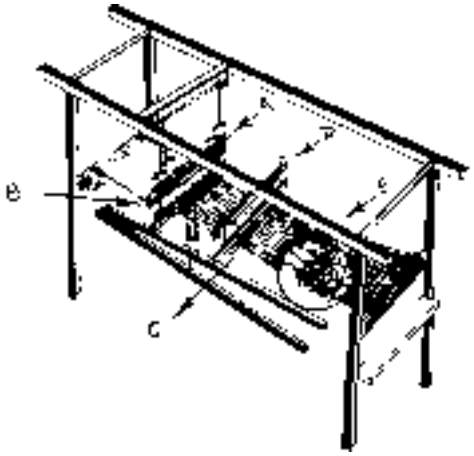


Fig. 24.11: Loom showing different parts A – harness B – warp C – shuttle D – reed E – thread count

24.2.1 Process of Weaving

The weaving operation can be compared to 'chatai' making. When a chatai is made, some ropes are held parallel to one another on a frame. The chatai maker lifts some strands with his fingers and passes another rope perpendicular to it and pushes it down with a blunt knife to make a compact chatai.

In weaving also, a similar process is carried out on a loom. Warp yarns are laid parallel and very close to each other. Then, with hands or some other device some warps are lifted and others remain as such and the weft on a shuttle is then passed through them to complete the interlacement. For example alternate warps could be lifted to get a plain weave fabric. To make the weave compact, the wefts are beaten with a comb like device called reed.

In handloom these activities are done manually. But now-a-days power looms are being used to do weaving at a fast rate.

24.2.2 Types of Weaves

You must have seen that the clothes that you wear have different woven designs. Designs can be due to -

- use of different types of yarns like simple, ply, complex and textured.
- use of different ways of interlacement of warp and weft yarns

1. **Plain Weave:** - It is the simplest weave and therefore inexpensive to produce. Many fabrics that you commonly wear like mulmul dupattas, organdy and chiffon sarees are all plain weave. Each and every weft yarn goes alternately under and over the warp yarns across the width of the fabric. If the yarns are close together, the plain weave has a high thread count and the fabric will be firm and will wear well.

Fig. 24.12 Plain Weave

Plain weave is of two types-

Rib Weave
Rib or line effect is created by using thin yarns with thick yarns or single yarns with doubled yarns in any one direction of the fabric.

Basket Weave
Two or more weft yarns are interlaced as a unit with corresponding number of warp yarns to give a basket like effect. Mattee fabric commonly used for cross stitch embroidery is an example of such a weave.

Fig. 24.13 Basket Weave

2. **Twill Weave -** This basic weave has a clear diagonal line on the face of the fabric. The denim or jean fabric you wear is twill weave. It is a very strong and durable weave. It is therefore commonly used in men's suit and coat fabrics. Twill weave fabrics show soil less quickly than plain weave.

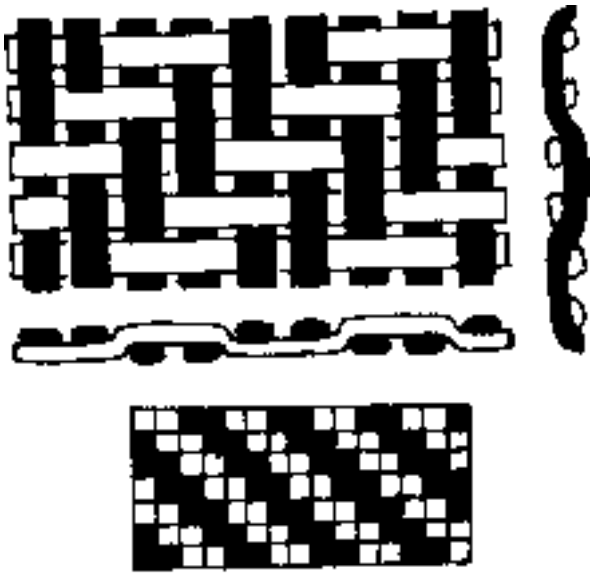


Fig. 24.14 Twill Weave

3. **Satin Weave -** This basic weave has a beautiful shiny surface because of long floats on the surface of the fabric. In the satin weave warp yarns float over several weft yarns before interlacing with a weft yarn and so on. However, the long floats snag easily therefore satin weave is not as strong as plain or twill weave.

Besides the basic weave you must have seen the fancy, decorative design weaves like the booti design woven in the fabric. Corduroy has raised parallel vertical lines. A towel has loops covering its both sides. All these fabrics are made using special looms and weaving techniques. They are obviously expensive fabrics.

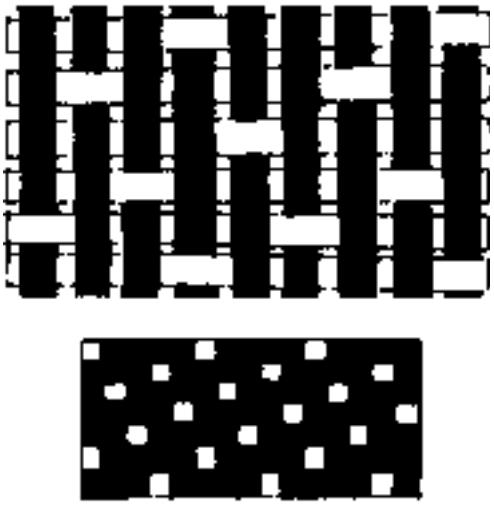


Fig. 24.15Satin Weave

Activity : 24.2 Collect samples of different type of woven fabrics. Stick them in your Record Book. Observe these samples carefully, identify their weaves and note down in your record book.

Sl.No.	Sample	Weave
1.		
2.		

INTEXT QUESTIONS 24.2

1. Give one word for the following sets of words:-
   i) Interlacing of two sets of yarns at right angle _____.
   ii) Only one set of yarns is interlooped to get a fabric_____.
   iii) Total number of yarn per square inch of fabric _____ .
   iv) Weave that has long floats on the surface which give it a shine _____.

2. Label the diagram given above.

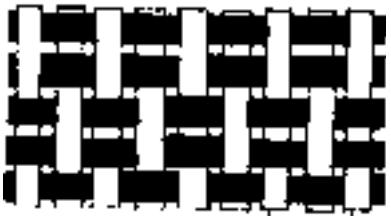


Fig. 24.16

3. Give single word for the sentence in bold.

   Read the lesson carefully to find these words.

   a) **Open mesh fabrics with large geometrical shapes** was used to make Munni's frock.

   .....

   b) We bought a fabric which was made **using two sets of yarn** in green colour.

   .....

   c) Why don't you attatch **criss cross yarn making intricate design** on your shirt?

   .....

   d) He bought a trousers having **dominant diagonal lines** in it.

   .....

   e) She made a cross stitch wall hanging on a fabric with **two or more weft yarns interlaced as a unit with corresponding number of warp yarns.**

   .....

24.3 KNITTING

Knitting is making of cloth with the help of needles to create a series of interlocking loops with a single yarn.

You already know that there is only one ball of knitting yarn and with the help of two needles, loops are made and when one row of loops are made, the next row is formed by interlooping with the previous loops.

This fabric making method gives us a very comfortable and stretchable fabric which does not wrinkle. Due to its elasticity, it can fit various sizes. Knitted fabrics are used not only for sweaters but also for hosiery articles like vests, socks, underwears, etc. It is specially suited for winter wear. Knitted wool keeps as warm since it has many air spaces which trap the body heat and provide warmth.

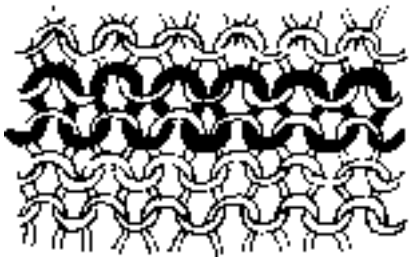


Fig. 24.17 : Knitting

In a knitted garment you will see the following:

Courses: These are the series of successive loops lying in crosswise direction.

Wales: These are the lengthwise or vertical columns of loops.

Fig. 24.18 : Wales

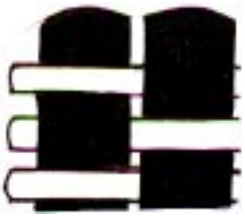
Fig. 24.19 : Courses

You must have seen that the size of the knitting needles is chosen keeping the thickness of the wool in mind. Garment edges like borders are usually done with fine needles so that the borders retain their shape.

24.4 WEAVING VS KNITTING

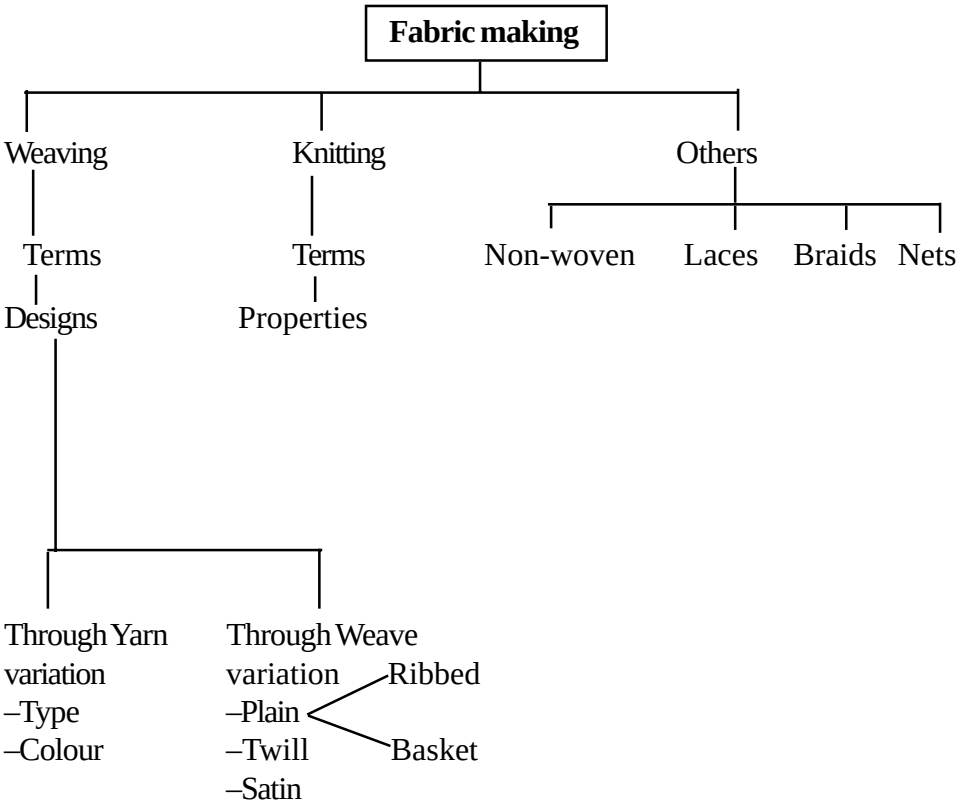
As you have seen both weaving and knitting are the popular methods of fabric making and depending upon the end use and properties needed either of them can be chosen. The following table gives a comparative picture of the two.

Table 24.1 Weaving Vs Knitting

Property	Weaving	Knitting
		
	Fig. 24.20	**Fig. 24.21**
1. Number of yarns	Two sets of yarns interlaced at right angles.	One set of yarn interlooped with itself.
2. Equipment required	A loom-could be a handloom or automatic loom.	Needles - could be hand knitting or machine knitting.

3. Fabrics are	Firm, smooth, stable and maintain their stiffness.	Wrinkle resistant, stretchable, limp and fit the body.
4. Care and maintenance	Need proper washing and ironing before re-use.	No ironing required but while drying have to be dried flat on ground.
5. Designs	Can be created by using different yarns (types and colours) and also weaves.	Are created by using various knitting yarns and by changing stitches or colour
6. Used for	Apparels, upholstery, curtains, draperies, table linen, bed linen, etc.	For undergarments, hosiery, sweaters, T-shirts socks, stockings, etc.

WHAT YOU HAVE LEARNT



TERMINAL EXERCISE

1. Enumerate the various methods of fabric making.
2. Discuss how designs can be created by weaving.
3. Compare and contrast weaving and knitting.

4. Why are knitted garments considered appropriate for winter wear?
5. Why is satin weave not as strong as plain or twill weave?
6. Why is twill weave used for your jeans?

ANSWERS TO INTEXT QUESTIONS

24.1 1. i) knitting
ii) lace
iii) net
iv) weaving

24.2 1. i) weaving
i) knitting
iii) thread count
iv) satin

2. a) warp
b) weft

3. a) net
b) woven fabric
c) lace
d) twill weave
e) basket weave

For more information
http://www.fabriclink.com
http://www.Rallnet.com/weavehtml

321en25

25

TEXTILE FINISHES

When we go to the market to buy a fabric, we see various types available and buy the material after a lot of questioning. Will it shrink after washing? Is the fabric colourfast? Can I wash it at home or does it require dry cleaning? Some fabrics have markings like, colourfast or 'antishrink' or 'wash' 'n' wear. We also come across textiles like 'lizy-bizy,' 'chandni', 'chinon', 'crinkle', and so on. Most of the time, these terms do not make much sense to most of us. Also, sometimes when you want to get your dupatta dyed in a particular colour the dyer refuses to dye it as it is polyester and can not be dyed. Does that mean polyester can not be dyed at all? But we see polyester dupattas in different colours. How are those dyed at all? Also when we want to buy fabrics for suits, salesmen show us designed fabrics which are 'tied and dyed' or 'printed' or are in 'batik'. How are these designs made? In this lesson let us find out answers to these and many more similar questions.

OBJECTIVES

After studying this lesson you should be able to:

- explain the meaning of a 'finish' and the importance of applying it to the fabric;
- classify finishes as renewable, durable, basic and special, and explain selected characteristics of each;
- list the types of dyes and discuss their special characteristics;
- enumerate the stages of dye application; and
- demonstrate the process of tie and dye, batik and printing.

25.1 WHAT IS A FINISH?

Have you seen a fabric that comes from a loom? It is generally rough to feel, dirty with stains and is known as 'gray cloth'. The 'markin' fabric which we buy for making quilt covers is off-white and dirty and is a gray fabric. But most of the other fabrics that we buy from a shop are smooth, neat and clean. Why and what happens in between? Yes, a finish has been applied.

> A finish is anything that is done to a fabric after weaving or knitting, to changes its appearance, hand and performance.

When a finish is applied, say on cotton, it might become more shiny, stronger or resist shrinking on washing. Similarly, other finishes may make the fabric softer or stiffer; water or stain resistant; coloured or designed.

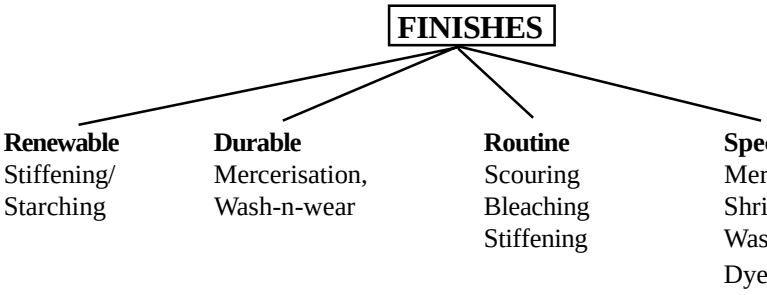
25.2 CLASSIFICATION OF FINISHES

Finishes can be classified as:

a) Renewable and Durable

b) Routine (Basic) and Special

Routine finishes are applied to almost all fabrics with an aim to improve their appearance. Special finishes are applied with a specific purpose or end use in mind.



We come across the problem of fabric losing its stiffness after washing or the fabric crushing badly after wearing. What do you do in such a case? You starch the fabric and iron it after every wash. This is called a renewable finish. That means, these finishes last only till washing or drycleaning but some finishes stay on the fabric for its entire life, eg., resistance to crease or the wash 'n' wear finish. These are not affected by washing, drycleaning or ironing. These finsihes are called durable finishes and they cannot be applied at home. Some of the finishes which are durable could also be special or routine.

INTEXT QUESTIONS 25.1

1. Fill in the blanks after unscrambling the clues in the brackets.

   i) A finish is applied to fabric to improve its _____, _____ , and _____(EPARACAPEN, DHAN, EPRAC MORFNE).

ii) Finishes can be classified as _____ or _____ and _____ or _____. (CIABS/ECALIPS, ENWELAERB/RBEDALU)

iii) A finish that is applied after every wash is called _____. (NRALEEWBE)

iv) When a finish is applied to almost all fabrics it is termed as _____. (UINORTE)

v) The rough, dirty and stained fabric received from a loom is called _____. (YRAG)

25.3 SOME COMMON FINISHES

Let us now discuss the basic characteristics of different finishes that can be applied on a fabric.

A. Basic Finishes

i) Scouring/cleaning

Fabrics received as gray cloth have a lot of impurities naturally present in them. These may be oils, waxes and dirty stains acquired during construction of the fabric. Complete removal or cleaning of these impurities is important before applying any other finish. This cleaning is called scouring and is done to all fabrics with the help of soap solutions and chemicals. After cleaning, the fabric becomes smooth, neat and more absorbent.

***Activity 25.1* Do and See:** Take a new and an old washed fabric and put them in water. What do you observe? The old one will sink faster because it is more absorbent. As soon as it absorbs water, it becomes heavier and sinks.

ii) Bleaching

When fabrics are made, they are not white in colour, due to impurities and colouring material present in them. To make them white or to dye them in light colours they are bleached. Suitable bleaching agents are used to remove the colour from the fabric. Bleaching is done for cottons, woollens and silks. Man-made fabrics do not need bleaching as they are naturally white. Can you recall some man-made fabrics?

Bleaching has to be done very carefully as the chemical which can destroy the colour may also damage the fabric to some extent. Hydrogen peroxide is a universal bleach which can be applied to all kinds of fabrics.

iii) Stiffening

Stiffening means the fabric which is generally limp becomes stiff when a stiffening agent is applied. How do you stiffen your cotton clothes at home?

Yes, you use maida starch or rice water. For stiffening silk, gums are used. Stiffening gives body, smoothness and lustre to the fabric. This practice is sometimes used to cheat the customer. You must have observed that sometimes if you rub a fabric between your hands, some white powder comes out. It is because the fabric has been overstarched. Inferior fabrics are overstarched to look dense and better. Avoid buying such fabrics. Can you say why?

Activity 25.2 : Take a starched fabric and rub it against your fingers. Then hold it against the light. The weave will look little more open in that area, as the starch has been removed. This will clearly indicate if the fabric is of good quality or inferior quality.This activity will enable you to select a good quality fabric.

B. Special Finishes

i) Mercerisation

Before finishing, cotton is a dull and rough fabric which wrinkles easily. When it is mercerised by using chemicals for eg. sodium hydroxide it becomes strong, lustrous and dyes well as it is now more absorbent. This is a durable finish. Now-a-days this finish has become almost a routine finish for all cottons. Threads used for stitching are also mercerised. Can you say why?

ii) Shrinkage control or antishrink

What happens when your new shirt becomes small after washing?

Reduction in size of a fabric after it is washed is known as **shrinkage.**

If the label on the fabric reads 'sanforised' or 'antishrink' or 'shrinkproof' then it means the fabric has received a finish for shrinkage control, and such a fabric will not shrink on washing. If this marking is not there on the fabric, you may shrink the fabric yourself at home. You probably do it many a times. You soak the fall in water before putting it on the saree or soak the cloth before getting a suit made out of it. Purchase the fabric, a little more than what you need, soak it overnight, squeeze and dry it. The garment made from this fabric will not shrink on further washing.

Activity 25.3 Find a new (unwashed) khadi cloth. Cut a 15 cm square piece. Wash the cloth and dry it. Measure the dry cloth. Is there any difference in the size? If the size remains unchanged it means that the fabric has not shrunk. The difference in size clearly indicates shrinkage of fabric.

iii) Water proofing

Fabrics to be used as raincoats, umbrellas, and tarpaulins have to be treated with chemicals to give them a property which makes them water resistant. The finish is called waterproofing and it is a durable finish.

iv) Parchmentisation

Have you observed something different about the organdy fabric? Yes, it is stiff though thin. At the same time it is quite transparent and when washed the stiffness still remains.

This is because of a finish called parchmentisation resulting in a permanent stiffness. You don't need to apply starch to organdy sarees.

v) Wash 'n' Wear

You know that cotton fabrics crush badly when in use. By applying the finish of wash-n-wear, cotton fabrics become easy to maintain as now they do not require repeated ironing and do not wrinkle also. This finish is a durable one and is produced by use of chemicals like resins.

vi) Dyeing and Printing

In the market, you see fabrics in plain colours or colourful designs apart from white ones. The processes of producing colours and designs are called dyeing and printing. Dyeing gives a solid colour to the fabric whereas printing is an application of dye at specified areas to create a design. It is very important for the dyed and printed fabric to be 'colourfast', otherwise, if the colour runs on washing, rubbing or ironing the design is destroyed.

A simple test to check colourfastness is to rub a wet white hanky against the coloured fabric. If colour comes on it, the colour is not fast and the fabric should not be bought. If you have bought a cotton fabric whose colour runs, wash it only in cold water with salt added to it. This will help in fixing the colour to some extent.

INTEXT QUESTIONS 25.2

1. State true or false and justify the given statements.

   i) Scouring is a finish used to clean the fabric.

   .....

   .....

   ii) Bleaching has no damaging effect on fabric.

   .....

   .....

   iii) Shrinkage control can be done at home also.

   .....

   .....

iv) Organdy is permanently stiff.

.....

.....

v) Mercerized thread should be used for stitching.

.....

.....

2. Fill in the blanks by choosing correct words from the bracket.

i) Mercerisation is a _____ finish. (renewable/durable).

ii) Shrinkage control is indicated as _____ on the label. (sanforised/ parchmentised)

iii) Water proofing is a _____ finish. (routine/special)

iv) If on washing, the colour does not bleed, it has been treated for _____. (water proofing/colour fastness)

3. Name the finish required to achieve the following qualities in the fabrics.

i) a) Strong and lustrous cotton

b) It should dye well.

Finish required .....

ii) a) A crisp cotton fabric

b) It should be able to withstand daily washing during summer

Finish required .....

iii) a) Cotton that does not wrinkle easily

b) It does not require repeated ironing

Finish required .....

iv) a) Fabric should not absorb water

b) Water should not be able to pass through it.

Finish required .....

25.4 DYEING/FINISHING WITH COLOUR

When 'colour' is applied to a fabric it is termed as dyeing. Dyeing and printing of fabrics is usually done after routine or basic finishes but prior to the application of other finishes. But the question arises - Why do we dye fabrics? It is mainly done to give colour to the fabric and thus improve the appearance of the fabric.

The dyes which are used for colouring fabrics can be classified according to their sources.

A) Natural	B) Chemical
Saffron	Acid
Mehendi	Basic
Indigo	Azoic
	Direct
	Disperse
	Reactive
	Vat

Let us try to see each group-

Natural dyes:- These dyes are based on raw materials available in nature (plants, insects and minerals) and are non–polluting.

Chemical dyes : These dyes are not received from natural sources. They are synthetically made by using various chemicals. Chemical dyes are cheap and easy to apply, with overall good colour fastness but cause environmental pollution.

25.4.1 Stages of dye application:

When we go to the market we find it is not only fabrics which are dyed but sewing threads and knitting yarns are also available as dyed materials.

Dyeing may be done during

i) **Fibre Stage:** Both natural and manmade fibers can be dyed at this stage. It gives very uniform dyeing and fast colours. But there is a lot of wastage during further processing of fibres.

ii) **Yarn stage :** Sometimes yarns are also dyed, especially when they have to be sold as such. Hence in embroidery thread, sewing threads and knitting yarn, dyeing is done at the yarn stage.

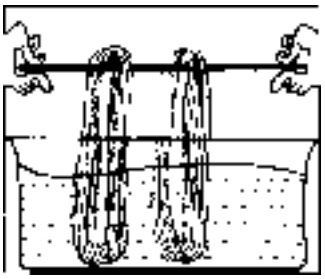


Fig. 25.1 Dying at yarn stage

iii) **Fabric stage :** This is the most popular stage of dyeing. Most of the fabrics which are dyed in a single solid colour are dyed at this stage. This method is a fast method and it is easy to match colours. Blended fabrics can also be dyed.

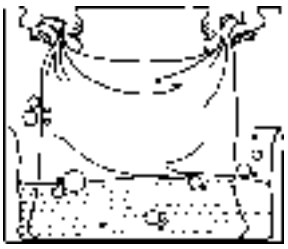


Fig. 25.2 Dying in fabric form

iv) **Garment dyeing:** Sometimes, after stiching the garment, there is a need to dye it, for example, dupattas for suits are dyed after making.

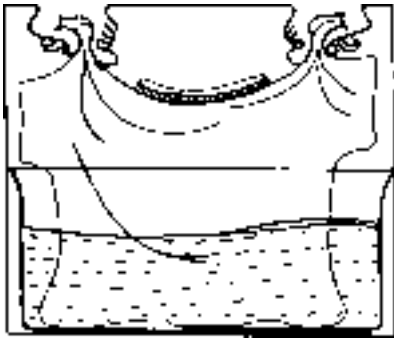


Fig. 25.3 : Garment dyeing

25.5 DESIGNING USING DYEING AND PRINTING

In order to get a design on the fabric, dyes have to be applied in a selective way. This can be done using the following techniques:-

A) Tie & Dye **B) Batik** **C) Block Printing**

A) Tie & Dye

You must have seen beautiful coloured bandhani dupattas with tiny white dots scattered all over the fabric. Have you ever wondered how this effect is achieved? This is done by a process of dyeing called tie and dye.

Tie and dye is a process of resist dyeing

'**Resist dyeing**' means doing something to the fabric so that some obstruction is provided to the dye. By tying, colour is restricted from entering the fabric. In the process of tie and dye selected areas of the fabric are tied as a result of which colour does not go through that particular portion. You can use the process to create a variety of designs on the fabric.

There are a number of ways in which you can do tie and dye. Some of these are presented here.

1. Marbling: Take the fabric and crumble it, then tie it with a thread at different areas randomly. Then dye the fabric. Open up after drying.
2. Binding: Pick up the fabric from one point and bind it with a thread at intervals.

Fig. 25.4: Marbling

Fig. 25.5: Binding

3. Knotting : Put knots on the fabrics wherever desired and dye it.

Fig. 25.6: Knotting

4. Folding: Fold the fabric and then bind it.

Fig. 25.7 Folding

5. Clump tying: Take some beads or pebbles and put them in the fabric and then tie.

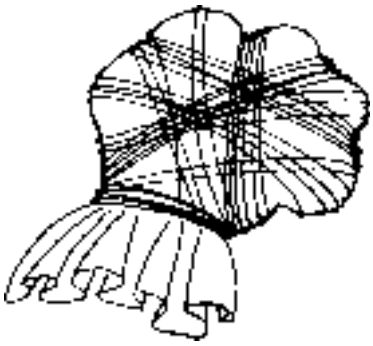


Fig. 25.8: Clump tying

6. Tritik : Make the design with a running stitch, pull the thread and tie it.

Fig. 25.9: Tritik

B) Batik

Another technique of resist dyeing is batik and in this case the obstruction to dye is provided with the help of wax. Wax is applied on selected areas of the fabric and when dyed, dye does not penetrate the waxed areas, resulting in a patterned effect or design. The wax can be applied with the help of a brush or blocks.

Fig. 25.10 : Batik

C) Printing

Printing, as you know is the patterned effect of colour/dye applied locally. Have you ever gone to a post office? There, every letter is stamped whereby a stick with a stamp on it is pressed into an ink pad and then put on the letter. Block printing is similar to this where a wooden block which has a design engraved on it is pressed into a thick dye paste and then to the fabric. You can use the same procedure at home using objects which are easily available as a block.

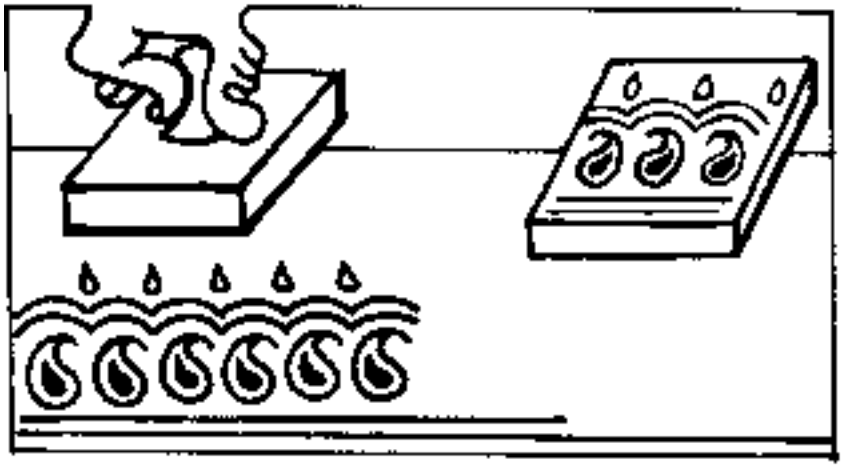


Fig. 25.11 : Block Printing

You can use your imagination to create interesting patterns. There are some pattern given below. These patterns have been created with the help of household articles. Can you think of some other patterns or designs?

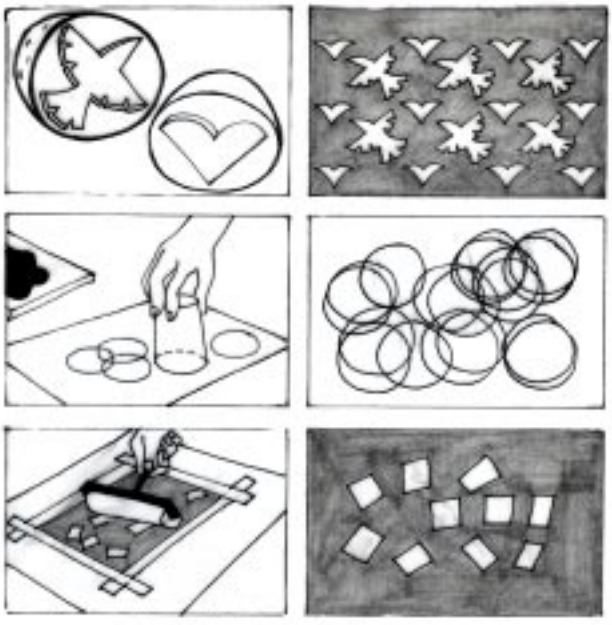
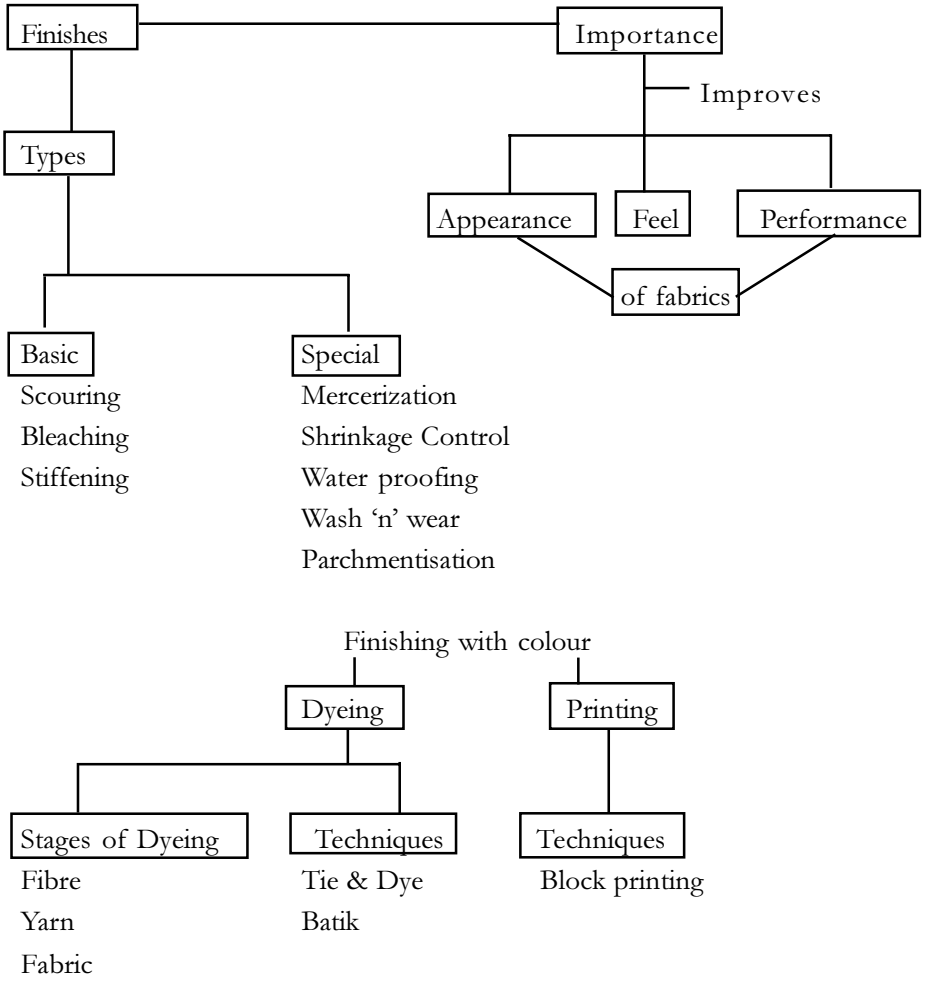


Fig. 25.12

Activity 25.4: Look out for available materials at home that can be used for block printing creatively. List them in the given box .

S.No	Materials that can be used for blocks printing of fabrics.

WHAT HAVE YOU LEARNT



TERMINAL EXERCISE

1. What is a textile finish? Why is it necessary to apply it on fabric?
2. Explain two basic finishes.
3. Name the special finishes and describe the process and use of each.
4. "Dyeing is finishing with colour". Explain.
5. Name the various stages at which textiles can be dyed. Explain them using diagrams.
6. Define printing.

ANSWERS TO INTEXT QUESTIONS

25.1 i) Appearance, performance
ii) Basic/Special, renewable/durable
iii) renewable
iv) Basic or routine
v) Gray fabric

25.2 1. i) Yes, scouring is washing fabric with soap and chemicals to remove all impurities
ii) No, Bleaching has to be done very carefully. It destroys the colour. Strong bleach can damage the fabric to some extent.
iii) Yes, soaking the fabric overnight and drying it causes shinkage.
iv) Yes, this is due to a permanent finish called Parchmentisation.
v) Yes, mercerization makes cotton smooth, shiny and strong.

2. i) durable ii) sanforised iii) special
iv) colour, fastness

3. i) Mercerization ii) stiffening iii) wash-n-wear
iv) water proofing.

VIDEO

1. Dyeing and Printing techniques.
2. Understanding colour.

For more information log on to:
http://www.pburch.net

321en26

26

SELECTION OF TEXTILES AND CLOTHING

In the last four lessons you have been learning a lot about textiles. You know about fibres and their properties, fabric construction methods, and the different types of finishes applied to textiles. These finishes give fabric a specific look with the help of which we are able to recognise the fabric. What are some of the other indicators of fabric quality which can guide you? Similarly, some people wear only cottons as blends don't suit them. So, in that case, how do you get an assurance that what you are buying is according to your requirement? Most of the time the properties are dependent on the fibre content. So it is necessary for all of us to read the marking on the fabric/'Thaan' for making a right purchase.

This is about fabric, but what happens if you have to buy a ready-made dress? With every ready-made dress there is a 'label' which gives the necessary instructions. But most of us have the habit of not looking at these labels.

Let us go in to more details of these and sort out some of the problems related to selection of textiles and clothing.

OBJECTIVES

After studying this lesson you will be able to:

- explain the selection of fabrics for different end uses according to fabric properties;
- list and explain the factors influencing selection of clothing;
- state the importance of labels and markings as quality indicators;
- explain malpractices in trading of textiles and clothing;
- elaborate the points to be kept in mind white judging quality of textile products and ready-made garments.

26.1 SELECTION OF FABRIC FOR DIFFERENT END USES

When you look around your house you will find that there are various types of fabrics used for different things. Like, fabric used for curtains is different from the fabric used for apparel or the intimate garments. You will find that a particular type of fabric is used for a particular end use. The difference in fabrics is due to difference in fabric properties which, you know, depends on fibre, yarn, fabric construction techniques and also the finishes given to the fabric. Why do you buy cotton and not synthetics for summer wear?

Let us recapitu1ate fabric related properties very briefly here and learn how these influence our selection of textiles and clothing.

1. Fibre Properties

You have already studied properties of fibres in a previous lesson. Do you remember what they are?

They are:

- length and appearance of the fibre
- moisture absorption
- heat conductivity
- strength

Let us see how these properties influence our selection.

(i) Length and appearance: Can you recall fabrics made of staple fibres and those made of filament fibres? Yes, you are right. Cotton jute and wool are staple fibres and nylon and polyester are filaments.

How does the length of the fibre influence your selection? You know that fabrics made with staple fibres have a rough look and those made with filaments have a smooth and shiny look. Also, short wavy fibres like those of cotton and wool tend to become dirty very easily whereas long, smooth fibres like silk or synthetics do not become dirty easily and are easy to clean.

Hence, whenever you need cloth with a smooth and shiny look, you will look for fabrics made of filament fibres i.e. synthetics or silk.

Nowadays, some finishes are applied on rough and dull fabrics which give them a smooth and shiny appearance, for example, starched cotton has a smoother look. But you also know that starch is a temporary finish which is removed on washing.

(ii) Moisture absorption: Are you familiar with this property of fibres which makes the fabric either absorbent or non-absorbent? Cotton absorbs water/moisture easily whereas synthetic fabrics have low moisture absorbency. When the weather is hot and humid, we prefer cotton clothes because they absorb

the perspiration and keep the skin cool. Since synthetic clothes do not soak sweat, they are uncomfortable to wear in summers. Similarly, when choosing undergarments and socks, this property must be kept in mind because those are the areas where maximum comfort is needed.

(iii) Heat conductvity: This property refers to the ability of the fibre to conduct heat away from the body. You may recall that cotton and rayon are good conductors of heat and keep the body cool. Silk and synthetic fabrics are poor conductors of heat and wool is a very bad conductor of heat and keeps the body warm. Keep this property of fabrics in mind when you choose clothes for summer or winter. You are probably already doing this by selecting cottons for summers and silks and woollens for winters.

(iv) Strength: Property of strength is needed in washing of the fabric. Ease of washing a fabric depends upon the strength of the fibre when it is wet. You know that some fibres become weak when wet. Which are those? Yes, these are wool, silk, rayon, etc,. Fabrics like cotton and synthetics are extremely strong and can be washed and cleaned easily. Hence, clothes for daily wear which need frequent washing, must be made of cotton or synthetic fabrics. Delicate fabrics like silk are more suitable for occasional use so that they need not be washed frequently. Being the strongest fabric, nylon is used for industrial purposes for making parachutes and ropes.

2. Fabric Construction Techniques

In your previous lessons you have1earnt about various fabric construction methods. Each method, as you know, gives a special property to the fabric like knitting provides stretchability and elasticity to the fabrics so it is suitable for socks, undergarments, woollen sweaters, etc. Weaving provides smooth and firm fabrics so they can be selected accordingly for making dresses.

Now that you know that the properties of different fabrics depend upon the method of construction, you can choose the fabrics according to the end use.

3. Finishes Applied

You have studied about various finishes like mercerisation, shrinkage control, waterproofing, etc., which are applied on fabrics to enhance their properties and their appearance. Now the question is, does a finish influence your selection? Yes, a finish does influence our selection.

Supposing you go to the market to buy cloth for a salwar suit. You know that you will normally need about 4½ meters of cloth. You will have to buy some extra cloth because it may shrink on washing. How ever, if the fabric has the shrinkage control finish on it you do not have to worry about shrinkage. Similarly, if you need cloth to replace the cloth of your umbrella you cannot buy just any cloth from the market. You will ask for cloth which is waterproof. You may remember that fin-

ishes are generally applied to improve look of a fabric. But sometimes, a cloth of inferior quality is overstarched to hide the poor quality and thus make it look good. How can you find out the true quality of an overstarched cloth? Take the corner of the cloth and rub it between your hands. If a white powder shakes out of the cloth, avoid buying it.

So, when you are selecting fabrics, remember that all that shines and looks good cannot be of good quality. See carefully what you are buying and what is its end use. Knowledge of fabric properties will guide you to make a correct decision.

INTEXT QUESTIONS 26.1

1. Select the correct alternative from the four given below each statement. Complete the statement using the selected word.

   (i) Staple fibres give fabric a _____ look.

   (a) rough (b) smooth

   (c) lustrous (d) shiny

   (ii) Filament fibres give fabrics a _____ look.

   (a) dirty. (b) smooth

   (c) rough (d) dull

   (iii) _____ fabric does not becomes dirty easily.

   (a) Cotton (b) Organdie

   (c) Denim (d) Silk

   (iv) Most suitable fabric for making baby garments is_____.

   (a) silk (b) cotton

   (c) nylon (d) denim

   (v) A poor conductor of heat is _____.

   (a) wool (b) silk

   (c) cotton (d) denim

2. Fill in the blanks by choosing the correct alternative given along with each statement. Justify your choice in the given space.

   i) _____ can be scrubbed hard while washing. (cotton/rayon)

   _____

   ii) _____ is used for industrial purposes. (cotton/nylon)

iii) _____ keeps you warm in winters. (wool/polyester)

3. Tick (√) the statements which are true for knitted fabrics.

i) Made by interlooping yarns

ii) Have a rough look

iii) Have a smooth look

iv) Are very absorbent

v) Are generally stretchable.

26.2 FACTORS INFLUENCING SELECTION OF CLOTHING

The clothes that you choose to buy and wear are influenced by several factors such as climate, age, occassion, activity and occupation.

1. Climatic Factors

You wear cottons in summers and woollens in winters. As you know woollen clothes are expensive and proper care is needed for their maintenance. People living in cold climate need to wear woollen clothes to keep warm. People living in very hot climates as in desearts need to wear turbans of thick cloth to protect their heads and wear long robes to stay cool.

Fig. 26.1: Climatic Factors

Fig. 26.2 : Occassion

2. Occassion

When you are attending a marriage you wear dresses in bright colours like lehnga cholis, ghagras and shararas often accompanied by bright acessories like bangles, chain and earrings.

Do you think these elaborate dresses could be worn on busy routine days? You would rather feel comfortable in a dress which fits you well and allows for ease of movement. Simple clothing with minimum accessories like

a formal salwar kameez will give a more professional look for an interview. Sari, formal trousers, shirt, tie would be a good option that will make you feel active and confident.

3. Age

You must have noticed that the type of clothes worn change with age. Clothes worn by an adult–woman are definitely not the same as those worn by a college going girl. Similarly, men will prefer to wear light and comfortable clothes rather than fashionable ones. Let us see how the type of clothes worn change with age.

Fig. 26.3: Age

Infant Wear-The clothing requirements from birth to 12 months of age are few. The major requirements of the newborn are for warmth, comfort and cleanliness. Clothes should be soft and light as babies have tender and delicate skin. Since they are sleeping most of the time their clothes should be simple to put on and take off. It is also important that they should be easy to maintain. Cotton shirts that slip on or that have double-breasted front opening with snaps are some easy to wear styles. The diapers should be made of absorbent and soft cotton material.

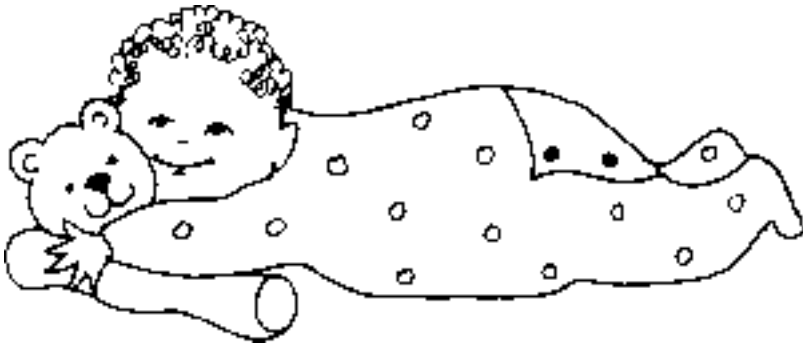


Fig 26.4 : Garments for Infants

School going children–Children of this age group are in the growing stage. They like to run about and play and are very active. Hence, their clothes must be made of strong and durable fabrics which can take a lot of wear and tear.

While selecting, do take care to see that there is adequate cloth inside the seams which can be opened up to fit rapidly growing children. The clothes must also be easy to launder as they get dirty frequently.

The later Teen Years–This is the age when one starts going to college. Teenagers are very conscious about clothes and want to wear the 'latest' styles. They like to have variety in their clothes because they do not want to repeat the same dress every day. For them, fit and style are important qualities of clothes and construction is not often considered. It is advisable to select clothes which they can mix and match so that they can achieve variety with few clothes e.g. few colours of churidars or salwars can be combined with few 'Kameez' which can go with all legwears. Similarly if a teenaged boy gets a couple of pair of jeans and a few T-shirts, he can combine them to achieve variety in his wardrobe.

Fig. 26.5: The later Teen Years

Fig. 26.6: Adults

Adults–Selection of clothes for adults depends to a large extent upon the type of work that a person is engaged in. A working woman will need clothes which are easy to launder and which do not need much ironing because she has very limited time. She will also prefer to wear clothes which do not easily wrinkle as she must look good till the end of the day. Do you remember which are the fabrics which do not wrinkle easily?

Old age Old age brings its own problems. The body becomes stiff, the eye sight becomes weak and energy level is considerably reduced. You must have also observed that normally old people wear light material. The clothes they wear must be loose and comfortable rather than fashionable. Also, it would be advisable for the clothes to have front openings which are easy to see and manipulate and large buttons and button holes.

4. Profession / occupation

You must have seen doctor and nurses in white or light coloured simple clothing. Such a dress gives a neat and clean look to the wearer and also has a soothing effect on the patient. What is the uniform of a soldier?

Many professions have a specific dress code which gives them a special identity for example people working in the hotel industry, airlines, traffic policemen, security gauards and so on. Sportsmen especially athletes and tennis players wear tiny shorts and snug tops of highly absorbent fabric. Such a dress may look out of

Fig. 26.7: Profession / occupation:

place when worn on other occassion. Similarly a swim suit would look appropriate only near a swimming pool. Clubs, hotels and often formal parties have their own dress regulations.

What kind of clothes should you wear when you have to take a long bus or train journey? Clothes for travelling should preferably of dark colours and should not crumple easily.

Certain specialised activities require special apparel for example special overalls are worn in the laboratory, during mixing chemicals for pest control by people or by those who work in nuclear power plants. They protect the workers against radiation hazards. Workers in mines wear mining suits and special helmets fitted with torches. Divers wear wet suits with slippers that help them move easily under water. Do you know astronouts wear space suits fitted with total life support system to sustain and protect them from the harmful effects of outer space? Firemen wear apparel made of fireproof fabrics. What should you wear while working in the kitchen? Yes, go in for snug cotton clothing. Avoid loose fitting clothes and hanging dupattas and shawls.

INTEXT QUESTIONS 26.2

I State true or false and correct the false statement.

1. Synthetic fibres are ideal for baby's under garments.
2. Doctors wear white coats to look fashionable.
3. Clothing for travelling should preferably be of light colours.
4. Delicate fabrics like silk are ideal for a long train journey.
5. Cotton shirts that are easy to slip on or that have double breasted front openings with snaps are some easy to wear styles for infants.

II Match column I with column II

Column I		Column II
1. Baby garments	a)	variety to mix -n- match
2. Teenagers	b)	denim
3. Active children	c)	made of absorbent cottons
4. School going children	d)	glamorous
5. Grandmother	e)	strong and durable
	f)	bright clothes
	g)	dresses with front opening

26.3 QUALITY ASSURANCE

Whenever you go shopping you want to buy a product that looks good, is durable

Notes

and easy to maintain. In a nutshell, you want a good quality product. What are the aids that help you make a good choice? Markings and labels on the fabrics and garments respectively are consumer aids which give you an idea about the quality of the product. Hence you can call them quality indicators.

26.3.1 Labels and Markings

Labels and Markings

(a) A lable is a piece of paper or plastic that is attatched to an object in order to give information about the object. A label can tell you what the object is, who has manufactured it and how to use it.

Today practically everything we buy has a label on it. Collect any 10 labels and look at the information given on them. You will find that all of these labels have some written information and/or some graphic display. Labels are made of many types of material- eg., paper, cardboard, fabric, tin or a simple tag attached to the product. In packages these can be a part of the package.

The information on labels includes brand names, pictures, designs, date of manufacture, packing, etc., and any other legal material that the manufacturer may care to put on it.

What about label on the yardage? What you see at the beginning of each fabric or 'Thaan' is called a 'marking'. Markings are shapes or designs printed on the surface of an object especially to give information and for identification.

Fig. 26.8: Brand labels

As far as consumer goods are concerned, sometimes we just look at the emblem, picture or name by which we may identify the product, eg., Bombay Dyeing or DCM products. These are ***brand labels*** .There are ***descriptive labels***, which give the chracteristics of the contents of the package such as size and variety of the products. Besides these types there are ***certification labels*** that claim approval of some agency other than the producer and clarify that the product meets certain accepted standards. For example, 'Woolmark' is used for pure wool products. There are also ***care labels*** which give information regarding washing, ironing, storing, etc., of the product.

Fig. 26.9: Care labels

Another type of labels are designed to tell consumers about composition of a product and what can be expected of it in the way of performance, how it should be cared for and the use to which it may be put. This type of label is called ***informative label***. So, to be really effective they must give sufficient

information to the consumer. However what all is given on a marking may not be meaningful, for example, a name like Lizy bizy is not providing any meaningful information about the composition of the fabric.

Activity 26.1: You must have collected 10 samples of labels. Look at them carefully and fill up the following table. One of these have been done for your convenience.

S.No	Label	Information provided	Placement of the label
1.	XL	Size. Extra large.	Stitched at the back of neckline.
2.			

INTEXT QUESTIONS 26.3

CROSS WORD

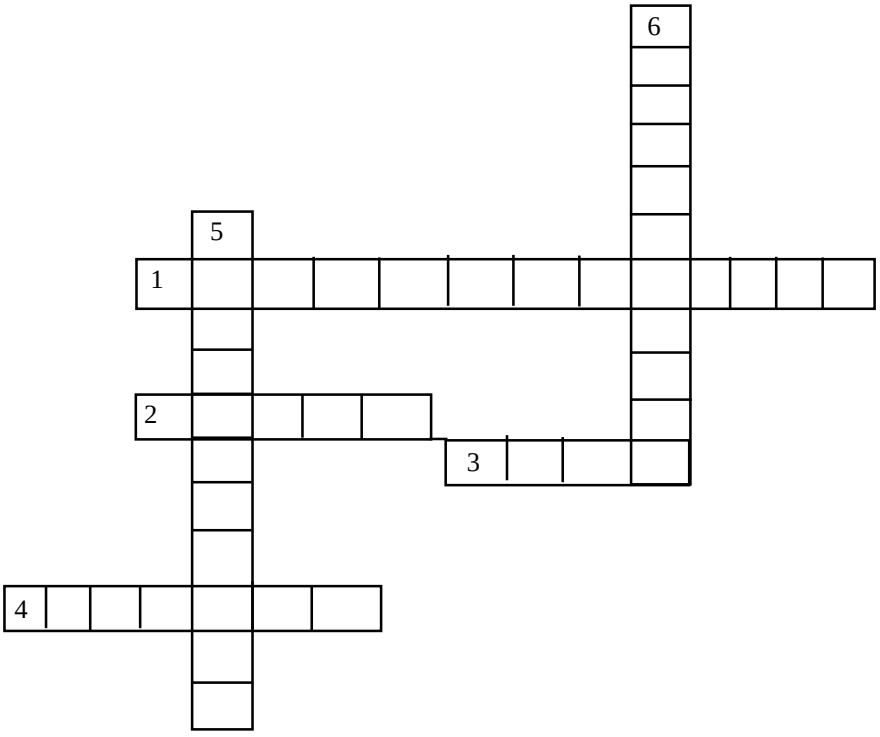


Fig. 26.10

Given below are the clues for different types of labels

Use these clues to fill in the cross word.

Accross

1. Of acceptable standards (13)
2. Company identity mark (5)
3. Information of maintenance (4)
4. Printed on fabrics (7)

Down

5. Content characteristics (11)
6. Stating product performance (11)

26.4 MALPRACTICES

You all must have heard about various types of malpractices by traders and/or manufacturers of food items or electrical gadgets. Same is the case with the textiles and clothing sector. It is essential for all of us to know about these and to do the needful to control these. Some of the commonly observed malpractices in this area are-

(a) Giving lesser quantity and/or poor quality of the product.

Four meters of fabric bought for a suit often turns out to be 3.80 meters when you measure it. The retailer who does this either uses a short measuring rod or stretches the fabric while measuring it.

(b) Cheating on price.

Traders charge more than the price displayed on the item or on the packet containing goods. They name some tax and add it to the price printed on to the lable. They may pick up some word on the label, eg., 'silk finish' and charge extra for it.

(c) Selling defective goods.

There are many places where traders sell materials of seconds as fresh and charge the price of fresh products.

(d) Providing false, misleading and incomplete labels and markings.

When you buy fabric for curtains, the marking should tell about light fastness. If it does not, then it is incomplete information. Similarly, the terms used should be meaningful and not misleading. The information provided should be correct. The information provided on the label on a garment is often quite vague and incomplete. For example, a label on a ready-to-wear garment does not say anything about washing, drying, ironing, and storing of the item.

So it is essential on our part as consumers to be alert and give no chance to the manufacturer or retailer to practice these malpractices and in case of complaint get in touch with concerned people to file our complaint. There is a Consumer Protection Regulation Act (1988) which covers all the above-discussedmalpractices.

INTEXT QUESTIONS 26.4

Crack the Code

How can you become an alert consumer? Using the code given below, decipher the qualities of an aware and alert consumer.

CODE

A=1	G=7	M=13	S=19	
B=2	H=8	N=14	T=20	Y=25
C=3	I=9	O=15	U=21	Z=26
D=4	J=9	P=16	V=22	
E=5	K=10	Q=17	W=23	
F=6	L=11	R=18	X=24	

(1) 23-1-20-3-8 20-8-5 6-1-2-18-9-3 2-5-9-14-7

_____ _____ _____ _____

13-5-1-19-21-18-5-4

_____

(2) 3-8-5-3-10 20-8-5 16-18-9-3-5 16-18-9-14-20-5-4

_____ _____ _____ _____

15-14 20-8-5 16-18-15-4-21-3-20.

_____ _____ _____

(3) 18-5-1-4 20-8-5 11-1-2-11-5 1-14-4

_____ _____ _____ _____

13-1-18-10-9-14-7.

_____

(4) 4-15 14-15-20 8-5-19-9-20-1-20-5 20-15 21-19-5

_____ _____ _____ _____ _____

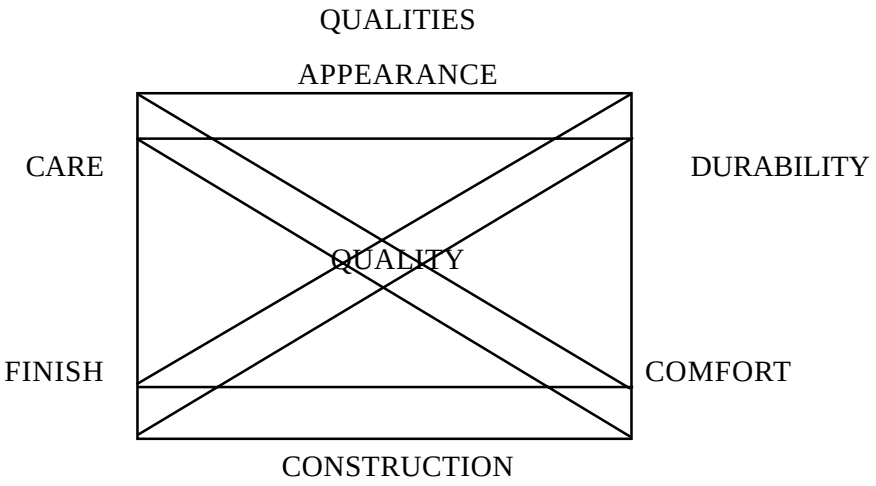
3-15-14-19-21-13-5-18 16-18-15-20-5-3-20-9-15-14

18-5-7-21-11-1-20-9-15-14 1-3-20

26.5 GUIDELINES FOR JUDGING QUALITY OF FABRICS

There is an astonishing variety of fabrics in the market these days. Manmade fibres, blends and a whole lot of natural fibres have brought a revolution in the textile industry. For instance, cottons blended with lycra are very popular in pants and jeans. These are comfortable and give a good fit. Khadi and its blends with cotton and silk are catching the eye of both young and old. Many synthetic fibre blends are also popular because of their easy wear and care property.

It is now possible to choose the fabric that is just right for a particular end use. But what qualities does one look for while selecting and purchasing fabrics?



When you go shopping just keep the following criteria in mind and you would be successful in making a good purchase.

Material

1. The cloth should be pleasing to touch.
2. Durability of fabric as you know, depends on the kind and quality of the fibre, strength of the yarn, the amount of twist in the yarn and compactness of construction. A closely woven fabric has a larger quantity of yarns than a loosely woven fabric and is therefore more serviceable.

Weave

1. Long floats in weave should be avoided as they tend to snag easily.
2. The strength of the cloth may be tested by applying tension between the two

thumbs. Threads should not slope away from each other if the cloth is soundly constructed.

3. Filler yarns should meet selvedges at right angle. Yarns at an oblique angle mean fabric is off-grain.

4. Weave should be uniform when you hold it up to the light and check for any unusally thin or thick areas. A fabrics with uneven weave does not wear well. The light test will also show up weak spots or any other irregularities.

Finish

1. Note the smell of the cloth, it should be clean and not oily.
2. Look against the light for even dyeing. If you notice that colour has rubbed off from the crease lines it indicates poor dye quality.
3. A geometic pattern should meet the selvedge at right angles. It is difficult to match an irregular print while making an apparel.
4. No powdery dust should appear when fabric is rubbed beween the fingers. Visible powder is an indication of too much starch. Manufacturers use high degree of sizing to conceal poor quality of fabric. Silk is also gummed heavily to increase its weight since the price increases with weight.
5. When buying velvets, towels, etc., see that the nap or pile in raised fabrics is dense and fine. Strength, particularly weftways, should not have suffered.

26.6 SELECTION OF READY-MADE GARMENTS

In today's fast moving life, it is very difficult to take out time for getting clothes stitched. You have to go to the market to buy a fabric, look for a tailor, order stitching and wait till the dress is ready. Or you have an alternative of buying a ready-made dress.

There are markets which sell ready-made garments at a very low price. The only problem is that these items are not made with your measurements hence may may not fit you. Hence it is important to know what you should look for when you are buying a readymade dress.

Guide to purchase readymades :

1. **Design of the garment:** The design of any item is guided by four important elements: basic style line, shape form, colour and texture or the type of fabric.

Fig. 26.11: Design of the garment

When these elements are put in a completed composition, they make a design which has balance, proportion, emphasis, rhythm and unity. Look around and examine carefully the dresses people are wearing. Why do they look good or bad? Can you see the four elements of design in them?

2. **Fit :** After you have selected a dress from its outer appeal, you have to see the size and fit. In fit, we look at the shoulders, bust, waist and length. It should be appealing to the figure. It should not be undersize or oversize. Take the exact measurements of the person and buy the garment accordingly.

3. **Workmanship:** Workmanship means the constructional details. So, look at the wrong side of the dress. Pull one end of the seam to check the durability. All seams should be double. Seams should be finsihed. There should not be any puckers in the seams. Check the fasteners and zippers by opening and closing. There should be enough seam allowance. Edges of collars should be well defined. No raw edges should be visible. Pipings, facings, etc., should be neatly done.

Fig. 26.12: Fit and workmanship

4. **Price:** Price factor actually goes along with all other factors. The quality of fabric, constructional details, embroidery, etc., will definitely influence the price. Normally, we have the idea that high priced garments are expected to be of high quality, but this is not always true. So it is essential on our part to see whether the price demanded actually provides us that much wear or not.

5. **Care and maintainance:** Most of the time we buy a dress and after the first wash we find that the colour of piping spoils the whole dress. Or sometimes after ironing, the lace gets burnt or that you have to repeatedly spend drycleaning charges even for a cotton suit because its colour is not fast.

For a wise slection of ready made garments we should read the care instructions at the time of purchase and tally with the price. Buy a fabric which requires mininum of care and maintenance.

INTEXT QUESTIONS 26.5

I Justify the given statements -

i) A closely woven fabric is more serviceble and stronger.
Justification .....
.....

ii) Long floats in weave should be avoided.
Justification .....

.....

iii) No powdery dust should appear when fabric is rubbed between the fingers.

Justification .....

.....

II List atleast two points that you would keep in mind for

a) selection of textiles on the basis of -

i) Weave 1.....

2.....

ii) Finish 1.....

2.....

b) selection of garments on the basis of

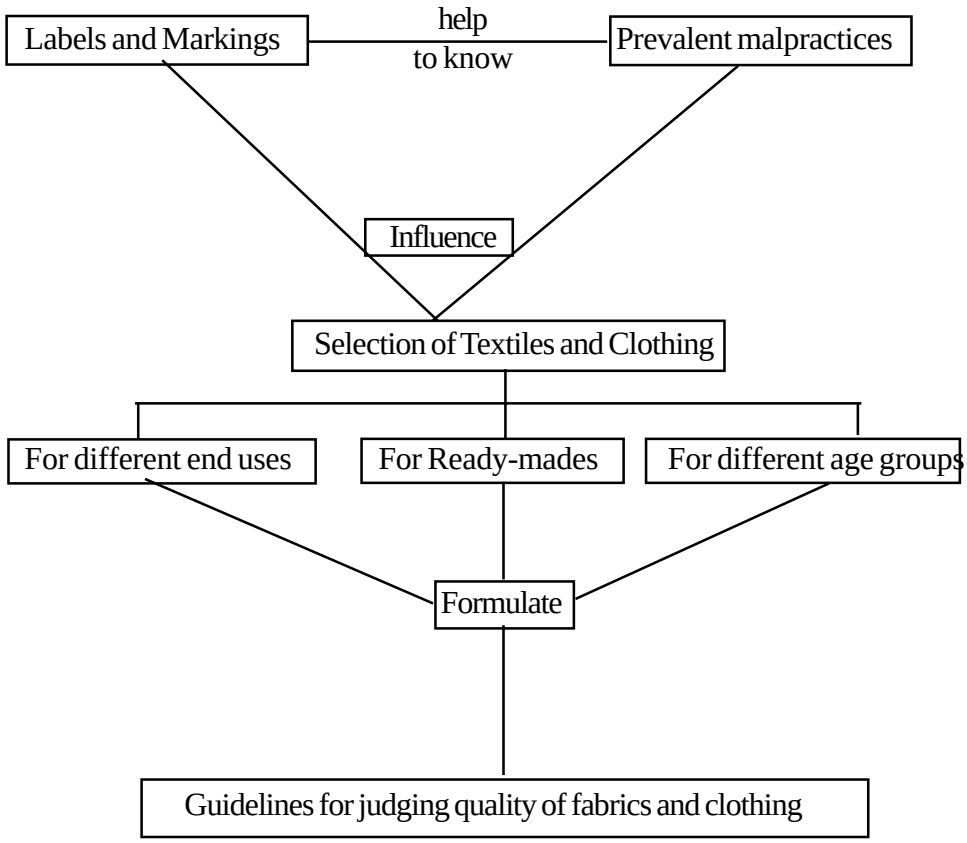
i) Work manship 1.....

2.....

ii) Care and maintenance 1.....

2.....

WHAT YOU HAVE LEARNT



TERMINAL EXERCISES

1. What is the difference between a label and a marking?
2. What are the different malpractices prevalent in selling fabrics?
3. Collect 10 markings and write about the informative label of marking. State why it is good.
4. What properties will you keep in mind while selecting fabric for curtains?
5. You have to buy a ready-made suit for yourself. How will you make a good purchase?
6. You have a college-going sister. What fabrics and dresses are most appropriate for her and why?

ANSWERS TO INTEXT QUESTIONS

26.1 1. (i) - a (ii) -b (iii) -d (iv) -b (v) -b

2. (i) Cotton (ii) Nylon (iii) Wool

3. (i) Cotton, as it gains strength when wet.

(ii) Nylon, due to it's strenth.

(iii) Wool, as it is a bad conductors of heat.

26.2 I. (1) False, synthetics clothes are non-absorbant. These can be very unconfortable as baby's clothes.

(2) False, doctors must bok neat, clean and efficient. They must protect themselves from infections. That is why they wear white coats.

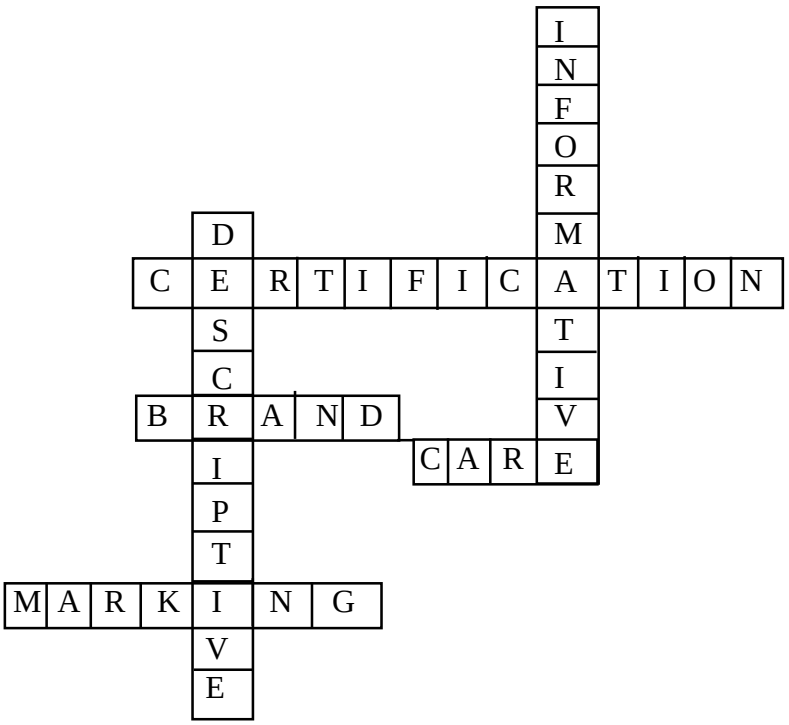
(3) False, during travelling clothes become very dirty. So, light colours should be avoided.

(4) False, one must wear strong and tough fabric during a long train journey. Only strong fabrics can withstand the wear and tear of a long journey.

(5) True, as a baby is mostly lying down such clothes are not only easy to wear but also does not hurt the delicate skin of an infant.

II 1-c 2-a,e 3-d,f 4-b 5-g

26.3 CROSS WORD



26.4

(1) Watch the fabric being measured.

(2) Check the price printed on the product.

(3) Read the lable and marking.

(4) Do not hesitate to use consumer protection regulation act.

26.5

I i) Refer to text 26.5

ii) Refer to text 26.5

iii) Refer to text 26.5

II a i) Refer to text 26.6

b ii) Refer to text 26.6

For more information

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27

CARE AND MAINTENANCE

We all know that clothes, with use, get dirty. They have to be washed, dried and ironed regularly for their long life, neat appearance and also for personal cleanliness and cleanliness of the environment. Hence, it is important to take care of our clothes.

You may also know that all fabrics are not washed and finished in the same way. For some fabrics you use hot water, while others are washed only in cold water. Some are washed with detergents while others with mild soaps. Some are hung on the clothesline, others are dried flat on the ground and so on. This means, different fabrics have to be given different care while washing.

Let us find out what these methods are and how to take care of various types of fabrics.

OBJECTIVES

After reading this lesson you will be able to:

- state the need for taking care of clothes and meaning of laundering and dry cleaning;
- explain the basic steps of laundering;
- describe the soaps and detergents;
- list various auxillaries and state their use;
- describe the procedure of removing different stains from different fabrics;
- elaborate different methods of washing and state their suitability to fabrics;
- list the precautions to be taken while storing clothes;
- explain the process of dry cleaning.

27.1 TAKING CARE OF CLOTHES

The first questions we must answer is, why do we need to take care of clothes? Well, we all know that when we wear clothes they become dirty due to the dirt, grease, perspiration, etc. Clothes look ugly if those are allowed to remain on the fabric. They also tend to loose their strength and stains can get fixed on the fabric. The dry dirt can be easily shaken off the clothes, but greasy dirt requires a special treatment.

27.2 MEANING OF LAUNDERING

Most of us think that "laundering" means only washing of clothes. But actually it includes washing as well as proper drying and finishing.

Laundering: Washing, drying and finishing of clothes.

Dry cleaning : Some clothes cannot be washed. These are cleaned by using solvents and/or grease absorbents. In other words, clothes are cleaned without the use of water which may damage the fabric or colour of the fabric. You will learn more about dry cleaning in the last part of this lesson.

27.2.1 Steps in Laundering

When you wash clothes at home how do you start? Probably you separate them according to coloured/white, cotton/wool/silk and less dirty/more dirty?

You do this, as you know that all types of clothes can not be washed together. Some preparatory steps are done to make washing more methodical. They are as follows:

i) **Mending:** Articles to be laundered are first examined carefully for any tears, or missing or loose buttons. They need to be stitched before washing. Can you say why?

ii) **Stain removal:** If there are some stains or marks of discolouration other than the dirt present on the articles, they should be removed or they might spread, get fixed or stain other fabrics in washing.

Fig. 27.1 : Stain Removal

iii) **Sorting:** Articles to be washed should be sorted out on the basis of the fibre type i.e., cotton, woolens, silks, and synthetics; whites should be washed separately from coloured ones. Also, very dirty articles like dusters should be washed separately from cleaner clothes.

Fig. 27.2 : Soaking

iv) **Soaking:** Do you soak your clothes before washing? Why do you do it? Soaking helps to loosen the dirt from the fabrics, and this makes washing easier. All fabrics cannot/ need not be soaked. For example, clothes which do not have fast colour should not be soaked. Woolens are not soaked because soaking leads to felting.

v) **Washing :** Clothes are now washed using appropriate detergent/soap and also the right method of washing. You will learn about both these in detail in the next unit of this lesson. Process of washing helps in releasing the dirt from the fabric.

Fig. 27.3 : Rinsing

vi) **Rinsing:** All soap/detergent and/or chemicals used must be removed from the fabric. Hence clothes are rinsed 2-3 or 4 times using fresh water everytime. In fact rinsing should continue till all soap/detergent is removed.

vii) **Starching and/bluing**: Clothes must be starched if they need to be starched and also blued to return their whiteness. The detailed process will be explained in the next section.

viii) **Drying**: You proably know that clothes are dried differently. White clothes are dried in sun and cloured clothes are dried in shade. Silk, white or coloured, are dried in shade. Synthetics are dried on hanger and in shade. Woolens are dried in shade and flat on the floor.

ix) **Ironing and Pressing**: The last step of laundering is ironing. Clothes are ironed according to the nature of the fabric. Cottons are sprinkled with water and ironed using hot

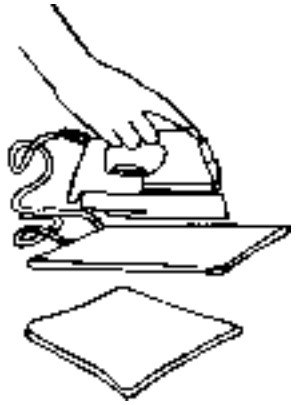


Fig. 27.4 : Ironing and Pressing

iron - Silks are brought in while damp and ironed with hot iron. Synthetics and rayons are ironed with moderately hot iron. Woolens are pressed with hot iron but over a damp muslin.

INTEXT QUESTIONS 27.1

1. Write short notes on

   i) Sorting : .....

   ii) Washing and Rinsing : .....

   iii) Ironing and Pressing : .....

27.3 DETERGENTS

A detergent is a product which is capable of cleaning. Detergents can be of two types: soaps and syndets.

a) **A soap** is a cleanser obtained from mixing of natural oil/fat and waxes.

b) **A syndet** is a cleanser produced synthetically from chemicals.

In your daily life you must have had experience of working with soaps. You must have observed the various properties of soaps. Soaps are good cleansers. But you know syndets are even better. Both the cleansers act by helping penetration of water into the fabric by reducing the surface tension of water.

But **differences** are there

i) As you know that soaps **wet** the fabric more readily than water but syndets acts even more readily than soaps.

ii) Also you must have observed that **dissolving** soaps in cold water is more difficult than dissolving it in hot water but syndets are soluble in both cold and hot water.

iii) Syndets have a good cleansing action even with hard water while soaps foam well only in soft water.

iv) Soaps do not have a distinct **smell** but syndets are sweet smelling. Hence clothes also smell nice when washed with syndets.

(v) Blueing has to the done after washing with soaps but syndets have blues and optical brightnes already added to them.

vi) You must have observed that your clothes tend to look dull after few washes with soap. It is because soap leaves soapy deposits on the fabric. This makes clothes look dull in due course of time. Syndets do not leave any deposits on the fabric.

vii) Soaps are cheaper than the syndets but if clothes become dull after few washes, what is the use! Hence syndets are more economical in the long run.

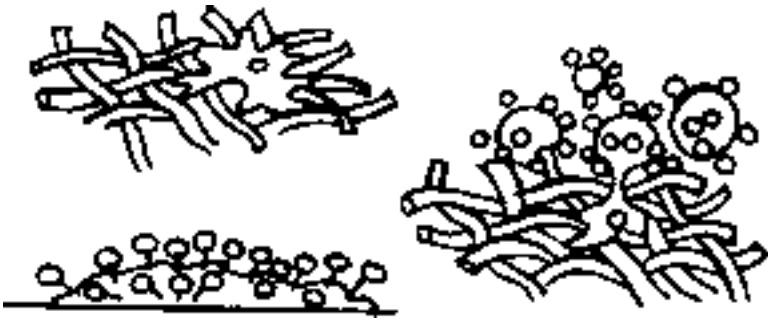


Fig. 27.5: Removal of dirt by detergents

INTEXT QUESTIONS 27.2

1. State whether the following statements are true or false and write the correct response for false statement.
   i) Soaps and syndets are detergents.
   ii) Raw material for all cleansers are available in nature.
   iii) Syndets have deeper penetrating action than soaps.
   iv) Use of syndets makes the fabric appear grey and dull.

27.4 AUXILLARIES

What do you do after cleaning the fabric with soap or a syndet? What do you do with your white cottons to 'retain their whiteness'? What do you do to make the cottons more crisp or why do you give your silks for 'Charakh'? So, this makes it very clear that besides cleaners there are other things required while laundering which will give new life to your fabrics. Such substance are called auxillaries. Can you define an auxillary in laundering? See the following box.

> Products other than the cleansers, required to give good finish to the fabrics during the process of laundering are known as Auxillaries.

Can you now list some of the auxillaries in laundering?

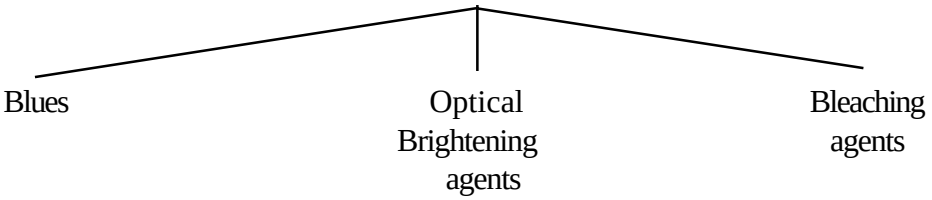
These are

- Blues
- Optical brightening agents
- Chemical bleaches

- Stain removing agents
- Stiffening agents.

Have you ever noticed that after 2-3 wears and washings your white cottons and linens lose whiteness and get a yellowish tint. You probably apply blue to counter-act the yellowness of the fabric. You should know that besides blues you can also use bleaching agents and optical brightening agents.

Therefore, yellowness of white fabrics can be removed by



A. Blues

A blue is defined as a chemical used as a fabric whitener. It is obtained from chemical, vegetable and mineral sources and is available in the market in powder or liquid form. There are many types of blues and their colour varies from violet to blue to bluish green. Wherever blue has to be applied–

- it should be applied just before the last rinse
- the blue water should be mixed thoroughly before putting fabric into it.

This will help avoid formation of blue speckles on the fabrics and helps in even application of blue, eg., ultra marine blue and prussian blue.

B. Opticals Brightening Agents/Flouroscent Brightening Agents (OBA's/FBA's)

Have you ever read the contents or list of ingredients written on the packet of syndet? You will come across OBA or FBA. Also, in the market, ask specifically for OBA's, they are available with very famous brand names.

Optical brightening agents are colourless dyes. They are fluorescent compounds which give very bright colours when applied to the fabric and dried in the sun.

These OBA's absorb light from the ultraviolet region and reflect back in the visible region. This reflected light has the effect of counteracting the yellowness, thus brightening the whiteness of the fabric. All clothes start looking whiter than white. There is no chemical action so it has no harmful effect on fabrics.

C. Chemical Bleaches

You must have seen on television various advertisements of bleaches. Do you

know what are these, what is their composition and how they make fabric whiter and brighter? Bleaches can be defined as

> ***A bleaching agent is any material or compound that whitens or brightens the fabric through chemical action. This action may be oxidizing or reducing.***

These bleaches help in removing colouring matter from fabrics. These are also used as stain removal agents.

Bleaches are of two types:

a) Oxidising bleaches.

b) Reducing bleaches.

a) Oxidising bleaches

These bleaches leave an almost permanent effect. These are used widely for application on vegetable fibres like cotton and linen. Examples of oxidizing bleaches are:

i) Sun light – It is the oldest and most simplest method of stain removal. Wet the stain and put on grass. Chlorophyll, moisture and oxygen from air bring about bleaching of the stain.

ii) Javelle Water (Sodium hypochlorite Na_2CO_3)

They should always be diluted before use. The fabric should be in bleach till the stain is removed. Further, the fabric should be rinsed to remove any remaining bleach in the fabric as it may harm the fabric by weakening it.

iii) Potassium permanganate ($KMnO_4$) and Oxalic acid

Used for stains caused by dyes, mildew, pespiration and ink. The brown stains (which may be caused due to any reason like rust, or stains caused due to paan) can easily be removed by oxalic acid and by combination of $KMnO_4$ and oxalic acid.

iv) Hydrogen Peroxide (H_2O_2)

It is a universal bleach applied on both vegetable and animal fibres. Therefore it is a safe bleach for the silks, woolens and rayons as it has no harmful effect on animal fibres. Always store H_2O_2 in dark bottles, otherwise it does not remain effective.

b) Reducing Bleaches

Reducing bleaches are less strong in action than oxidizing bleaches and are applied on animal fibres like wool and silk. These bleaches do not have permanent effect on the fabric. Wool and silk sometimes turn yellow when they come in contact with air after bleaching with reducing bleaches.

This happens because wool and silk are animal fibre. Reducing bleaches are applied to make them pure white and when these fabrics come in contact with air slowly and gradually they turn yellow and loose their bleaching effect.

Examples of reducing bleach

i) Sodium Hydrosulphite

ii) Sodium Bisulphite.

INTEXT QUESTIONS 27.3

1. State whether the following are true or false and write the correct response for the false statement.

   a) The fabric should not be rinsed with water after bleaching and the bleach should be allowed to remain in it.

   b) Bleaches whiten or lighten the fabric by chemical action.

   c) Sunlight and moisture have bleaching effect on the fabric.

   d) Hydrogen peroxide can be safely applied on animal fibres.

2. Give one word for the following statements.

   a) A chemical compound which is capable of removing colouring matter from fabric making them whiter and brighter.

   b) The oldest and cheapest method of stain removal.

   c) A bleaching agent which is used to remove brown stains from the fabric.

   d) A bleaching agent which can be safely applied on animal as well as vegetable fibre.

   e) Pure white wool and silk turn yellow in colour in due course of time due to application of this bleach.

27.5 STAIN REMOVAL

Stains are marks other than dirt on clothes. For example, you may get a curry or pickle mark on your shirt while eating or an ink stain while writing, or a paint stain

if you accidently come in contact with a newly painted door. Such marks are called stains and if allowed to stay for long they make the clothes look ugly.

Fig. 27.6

27.5.1 How to identify a Stain?

In order to decide which procedure to use for stain removal it is important to identify the stain first. For this, one has to see the following:

a) Colour: Every stain has a specific colour, for example, curry and pickle are yellow while coffee and tea stains are brown, grass stain is green.

b) Smell: Some stains have a peculiar smell eg., stains of eggs or paints. These stains can be recognized by the smell.

c) Feel: Some stains also change the feel of the fabric and can be recognized on that basis. For example paint or sugar syrup makes the fabric stiff to touch, whereas lipstick or shoepolish make the fabric feel slippery.

Activity 27.1 : Stain some fabrics with lipstick, nailpolish, ink, shoepolish, curry, pickle, milk, blood, etc. Shuffle them and then try to identify them by studying the colour, smell and feel. Record your findings in the following table.

S.No	Observation	Stain
1.	Colour ..... Smell ..... Feel	
2.	Colour ..... Smell ..... Feel	

Stains can be put in following categories and similar methods can be adopted to remove stains from each group:

1. **Vegetable stains**-like curry, tea, coffee
2. **Animal stains**-like milk, blood

3. **Grease stains**-like pickle, curry, shoe polish, etc.
4. **Mineral stains**-like rust
5. **Grass stain**
6. **Miscellaneous stains**-dyes

27.5.2 Methods of Stain Removal

Fig. 27.7: Dipping

Fig. 27.8: Sponging

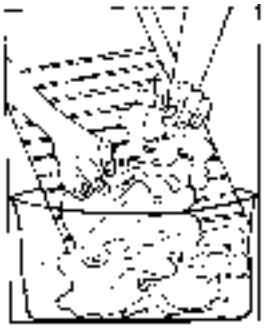


Fig. 27.9: Drop method

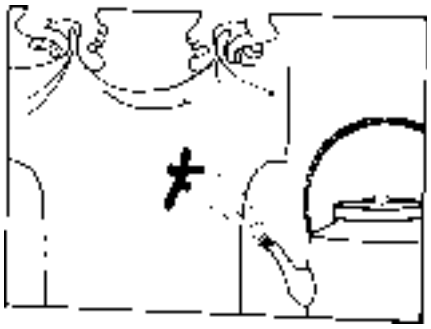


Fig. 27.10: Steaming

27.5.3 Precautions While Removing Stains

Stains should be removed very carefully. If some general precautions are not observed, there might be a damage to the fabric itself. So whenever you have to remove a stain, do the following:

1. As far as possible, remove the stain when it is fresh.
2. Find out whether the stained fabric is cotton, wool, silk, or synthetic.
3. Try to identify the stain.

4. For unknown stains, start the stain removal with a simple process and then move on to a complex one. Always wash the stain with cold water first as protein stains like blood and egg coagulate with hot water and became difficult to remove.
5. Chemicals used should not damage the fabric.
6. For delicate and/or coloured fabrics try out the chemical on a small portion of the fabric first. In case the fabric is damaged do not use it.
7. Repeated use of a milder reagent is better than a one-time use of a strong reagent.
8. Wash all fabrics with soapy solution at the end to remove all traces of chemical from it.
9. Dry fabrics in the sun as sunlight acts as a natural bleach.

Table 27.1
Stain removal for different stains

Stains	White Cottons	Coloured Cottons	Silk and Woollens	Synthetics/nylons polyester, acrylic
Tea/ Coffee	*Fresh* Pour boiling water on the stain. (2 cups of water + ½ teaspoon of borax)	Soak in warm water and borax	Same as for coloured cottons	Same as for coloured cottons
	Old Dip the stain in glycerine	Same as for white cottons	Pour hydrogen peroxide solution and gently rub to remove the stain	Dip in warm water and a few drops of sodium perborate till the stain is removed
Blood/ Egg/ Meat	*Fresh* Wash with cold water and soap	Same as for white cottons	Same as for white cottons	Same as for white cottons
	Old Wash with salt water (2 tablespoons of salt + ½ bucket of water).	Same as for white cottons	Same as for white cottons	Same as for white cottons

Butter/ Ghee/ Oil/ Curry	*Fresh* Wash with hot water and soap *Old* Make a paste of soap and water and apply it on stain. Leave in sunlight until stain is removed	Same as for white cottons Same as for white cottons but leave in shade not in sunlight	Wash with water and soap Same as for white coloured cottons, but use a mild soap	Same as for silks and woollens Same as for silks and woollens

Note: When stain is fresh, apply talcum powder on it and leave it for a few hours. Brush off powder. This helps to remove the stain and can be used for all fabrics.

Paint/ Shoe polish/ Nail polish/ Lipstick/ Ball Pen	*Fresh* Scrape out all excess stain Rub gently with spirit or kerosene. *Old* Repeat the above method two or three times	Same as for white cottons Same as for white cottons	Same as for white cottons Same as for white cottons	Same as for white cottons Same as for white cottons.
Grass	*Fresh* Wash with soap and water *Old* Dip the stained portion in methylated spirit	Same as for white cottons Same as for white cottons	Same as for white cottons Same as for white cottons	Same as for white cottons Same as for white cottons

Betel leaf (paan)	*Fresh* Apply a paste of onions and leave in sunlight	Same as for white cottons but leave in shade	Same as for coloured cottons	Same as for coloured cottons
	Old Repeat above method two or three times	Same as for white cottons	Same as for white cottons	Same as for white cottons
Mehndi	*Fresh* Dip in warm milk for half an hour	Same as for white cottons	Same as for white cottons	Same as for white cottons
	Old Repeat the above 2 or 3 times	Same as for white cottons	Same as for white cottons	Same as for white cottons

Remember: It is important to wash the fabric well after the stain is removed so that all the chemicals used are completely removed.

INTEXT QUESTIONS 27.4

1. For removing each of the following stains, choose the most appropriate method out of the four given:

   i) Old tea stain on a white cotton fabric–

   a) Use salt water
   b) Soak in glycerine
   c) Soak in lime juice
   d) Pour boiling water

   ii) Old blood stain on a coloured cotton fabric–

   a) Use salt water
   b) Soak in glycerine
   c) Soak in hot water
   d) Wash with hot water and soap

   iii) Lipstick stain–

   a) use salt water
   b) Soak in glycerine
   c) Soak in methylated spirit
   d) Wash with hot water and soap

   iv) Rust stain–

   a) Use salt water
   c) Soak in methylated spirit

b) Use lime juice and salt
d) Wash with soap and cold water

v) Fresh butter stain on silk–
   a) Wash with cold water
   b) Wash with cold water and soap
   c) Apply salt and leave in the sun
   d) Wash with warm water and soap

vi) Nail polish stain on a polyester fabric–
   a) Soak in methylated spirit
   b) Soak in warm water
   c) Soak in cold water
   d) Soak in warm water and soap

vii) Fresh ink stain on a woolen fabric–
   a) Wash with cold water and soap
   b) Wash with boiling water and soap
   c) Use salt and lime juice
   d) Soak in methylated spirit

27.6 METHODS OF WASHING

After you have mended the clothes, removed the stains, sorted and steeped the clothes, the actual washing starts. You know that some portions like cuffs and collars need extra rubbing because they become more dirty.

Fig. 27.11

Properties of fibres should be kept in mind while laundering them. Do you remember that cotton becomes stronger when wet while rayon loses its strength? That is why one can wash cottons by rubbing while rayons have to be treated gently. Also, wool and silk need special care as woollens lose shape in water and silk loses strength.

Thus, while selecting the method of washing two main factors need to be considered.

i) How dirty is the fabric and

ii) What kind of fabric it is i.e. cotton, silk, wool, rayon, nylon and so on.

Laundering is generally done by:

i) Friction washing

ii) Suction

iii) Kneading and squeezing

iv) Washing by machines

Let us now discuss these methods in detail.

(i) Friction Washing

This method is suitable for washing strong fabrics like cotton. Friction can be applied as follows:

a) By hand: This means rubbing vigorously with the hand. It is suitable for cleaning very soiled small articles like small garments, handkerchief, etc. It is economical in the use of soap.

b) With a plastic scrubbing brush: with a scrubbing brush friction is applied by placing the dirty article flat on a hard surface. It is suitable for very soiled household articles made of strong fabric, for example, dusters.

c) Beating with a stick: Large articles like bedsheets, etc., are washed by this method.

(ii) Suction Washing

This method is used for articles like towels, etc., which are heavy and have a pile weave, on which a brush can not be used.

The article is placed in soap solution in a tub and the suction washer is pressed down on it and lifted repeatedly. The vacuum created by pressing losens the dirt particles.

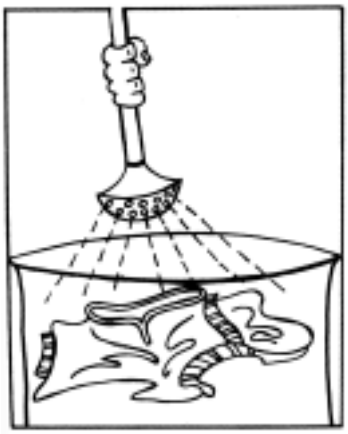


Fig. 27.12: Suction Washing

(iii) Washing by Kneading and Squeezing

Fig. 27.13: Washing by kneading and squeezing

This method is used for delicate fabrics like silk, woolens, rayon, etc. This method does not damage the fabric or change its shape as only gentle rubbing with hands is applied.

(iv) Washing by Machines

Washing machine is a labour saving device especially useful for large institutions. Now-a-days it is being used at home also. The washing time varies with types of fabrics and amount of soiling. Woollens take less time than cottons to get cleaned. The instructions with the machine should be read carefully before using it.

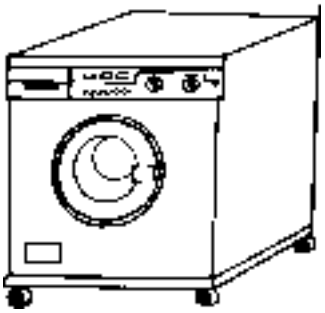


Fig. 27.14: Washing by machines

The detailed procedure of laundering specific fabrics is given in a chart on the following page.

27.8 STORAGE OF TEXTILES

Till now we have taken proper care in keeping our clothes clean but it is not sufficient. If we don't store these clothes properly, they can get damaged by insects or cloth moths.

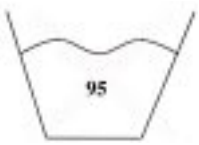
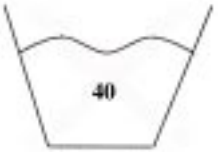
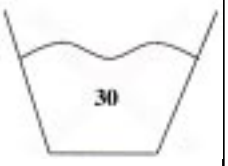
Let us list a few precautions in order to save our expensive clothes:

1. Empty out pockets and brush the garments thoroughly in order to free them from dust.
2. Always sun and air the garments which have been worn before storing.
3. Do not let garments become too dirty before laundering or dry cleaning.
4. Do not store any damp clothes as moisture causes mildew. You must have seen that clothes have changed colour when taken out from closets and this is the reason for it.
5. All textiles should be protected from insects. This can be done by using repellents like tobacco, dried neem, camphor, moth balls, etc., as you all do at home. Woollens can be packed in newspapers as the moth dislikes printer's ink. Boxes may be lined and covered with paper. Even driedreem leaves, sandal-wood dust, dry eucalyptus leaves are good as long as the odour lasts.

	Soaking	Washing	Rinsing	Stiffening	Blueing	Drying
Fabric	Soaking helps to loosen the dirt. Soak whites and very dirty clothes separately. • Use sufficient water for soaking. • Use warm to hot water for dirty articles. • Do not put too many clothes together. • Soak only for an hour or two and not overnight. • Do not soak coloured clothes at all, as colour gets affected.	• Use warm to hot water for very dirty and white articles. • Use cold water for coloured clothes. • Use friction method. • Rub hard with hand or brush at very dirty areas. Avoid very hard brush as it may damage the fabric. • For embroidered cottons wrap a cloth around the brush and then apply friction on the fabric. This makes brush action milder.	• After washing rinse the articles thoroughly, i.e. put the articles in water as many times as necessary to remove the soap completely. • Use cold water for rinsing.	Starch is used as a stiffening agent for cottons. All cottons except undergarments and close fitting garments like blouse are stiffened; Starched cottons appear smooth, shinning and fresh. They do not get dirty easily. To starch, add some of the starch paste in a basin of water and mix well. • Open the article, wet in water and then dip in the starch solution. • Squeeze the article well and hang it in sun to dry. • For heavily starched articles do not squeeze them hard.	Blueing is done only for white articles. You must have seen that white clothes tend to look yellow, so blueing is done to make them look white again. To blue - A teaspoon or so of the washing blue is tied in a thin cloth. In liquid form, add few drops of it to water. Stir the water well in both cases. Open the article and dip it in blue solution. Then squeeze and dry in the sun. **Note:** If articles are to be starched and blued, then blue can be added to the starch solution itself. If the article gets over blued dip it in plain water with a few drops of vinegar or lime juice then extra blue gets removed.	• Hang the clothes by the strongest point near the line. • Whites are dried in sun. • Cloured articles are dried in shade. • Heavy coloured clothes can be dried in sun but with wrong side facing out. **Note:-** Pick up the articles drying in sun as soon as they are dry as over- exposure to sun can weaken the fabric and cause yellowness.
Silk	• Do not soak as they lose strength when wet. • Use mild liquid soap or reetha nut solution in a tub of water and make a lot of lather.	• Use luke warm water as it helps to remove dirty easily. Do not use hot water. • Use light pressure for washing.	• Rinse out all soap in cold running water. Do not squeeze hard. • Add a few drops of vinegar or lime juice in the last rinse. This adds lustre to the fabric.	• Add gum water along with vinegar in the last rinse.		• Small articles can be rolled in a hand towel to remove excess water and ironed at once. • Large articles like sarees may be placed on the clothesline in the shade, till all the excess water is removed. Do not dry completely before ironing.
Woolens	Do not soak. *Important :* Before washing place the article on a paper spread on a flat surface and draw its outline.	• Use mild liquid soap or reetha-nut-solution in a tub of water and make lot of lather. *Note:* Do not use reetha-nuts for whites. • Use luke warm water as it helps in removing dirty easily. Do not use hot water. • Use light pressure for washing.	• Rinse out soap in cold running water. • Do not squeeze hard			• Place article back on the paper on flat surface and pull it into the shape of the original outline drawn. • Leave on flat surface, in shade, to dry. • Steam press if the article requires ironing. Place wet cloth on the dried woolen article and press it with a hot iron on top.
Synthetics **Nylon** **Polyester** **Acrylics**		• Use lukewarm or cold water. Hot water is not used as these get damaged by high temperature. They melt easily and can lose their shape when exposed to heat. • Use any good soap. • Use light pressure and light rubbing while washing.	• Rinse well in cold running water to remove soap completely. To avoid wrinkles do not squeeze.			• Dry preferably on a hanger to maintain the original shape. • When dry, iron only if necessary, with a warm iron and not a hot one as synthetics get damaged at high temperature.

Now, you are hopefully competent to increase the life span of your clothes. Whenever you wear and change your clothes remember what is required so as to avoid further problems. Here are some symbols you might find on labels that would help you take good care of your clothes.

Table 27.2 : Care symbols for machine wash

Care Symbol	*Agitation Washing Temperature*	*Rinse*	*Spinning/ Wringing*	*Examples of Application*
 **Fig. 27.11 Very hot**	maximum	normal	normal	White cotton and linen articles without special finishes
Fig. 27.12 Hot	maximum	normal	normal	Cotton, linen or viscose articles without special finishes where colours are fast at 60°C
 **Fig. 27.13 Hand hot**	medium	cold	short (reduced) spin	Nylon, polyester/cotton mixtures; polyester cotton and viscose articles with special finishes, cotton/acrylic mixtures
 **Fig. 27.14 Warm**	maximum	normal	normal	Cotton, linen or viscose articles, where colours are fast at 40°C but not at 60°C
Fig. 27.15 Cool	medium	cool	short (reduced) spin	Silk and printers, acetate and triacetate; including mixtures with wool; polyester/wool blends

Washing Temperatures

1. Water heated to near boiling temperature. 3. As hot as the hand can bear. 5. Cool	2. Hotter than the hand can bear. The temperature of water coming from many domestic hot taps. 4. Pleasently warm to hand.

Fig. 27.15 : Do not machine wash

Fig.27.16 : Do not wash

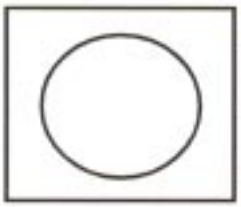


Fig.27.17 : Tumble dry

Fig.27.18 Drip dry

Fig.27.19 : Line dry

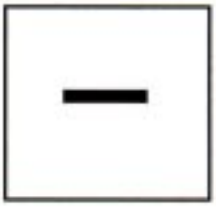


Fig.27.20 : Dry flat

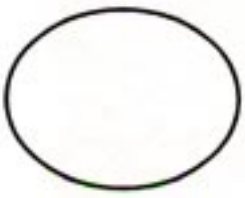


Fig.27.21 : Dry cleanable

Fig.27.22 : Do nt dry clean

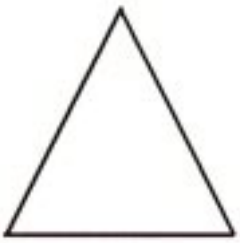


Fig.27.23 : Can be bleached

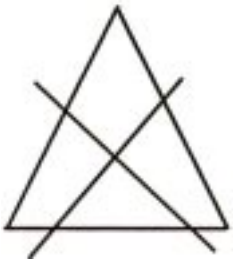


Fig.27.24 : Do not bleach

INTEXT QUESTIONS 27.5

1. Fill in the blanks using the most appropriate words from those given in brackets:

   i) Clothes must be _____ before washing.
   (dried, mended, ironed, starched)

   ii) _____ articles should not be soaked before washing.
   (coloured, white, dirty, small)

   iii) Soaking of clothes helps to _____ dirt.
   (increase, decrease, loosen, prevent)

   iv) Starching is done to give cotton clothes a _____ look.
   (dull, shining, rough, yellow)

   v) _____ should not be starched.
   (table linen, sarees, kameez, undergarments)

   vi) Coloured cotton articles should be dried in the _____.
   (sun, shade, daylight, night)

   vii) Overexposure to sunlight makes fabric _____.
   (bright, dull, blue, yellow)

   viii) Ironing should not be done directly on the _____.
   (collars, cuffs, sleeves, buttons).

   ix) When cotton articles are stored wet, they develop _____.
   (dullness, brightness, mildew, smoothness)

2. What do understand by the following symbols?

(i)

(ii)

(iii)

(iv)

27.9 DRY CLEANING

This is another method of taking care of clothes. Your expensive and delicate silk and woolen garments need to be drycleaned. In drycleaning, instead of ordinary washing, the dirt is removed by a solvent action and grease absorbents. The ad-

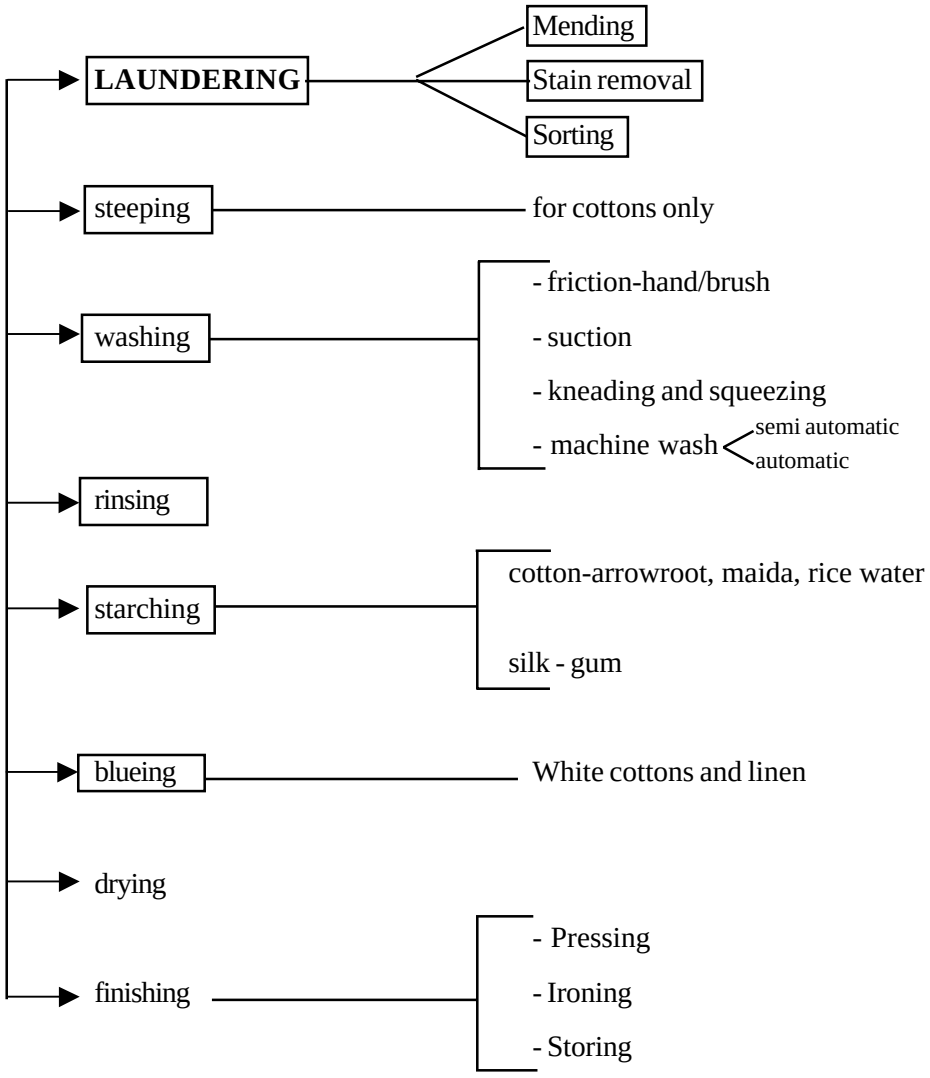
vantage of using these solvents is that they do not penetrate the fabric as water does in ordinary washing. These have no effect on the colour of the fabric, the material does not shrink, lose shape or finish as is frequently the case in wet cleaning.

Woollens, as you remember, do not get dirty quickly hence do not need to be washed as frequently as other fabrics. Hence, what they really require is "spot cleaning". You can do the spot cleaning at home. Dirty spots get fixed to the fabric with grease. If you remove grease the spot is gone. Use grease absorbents or solvents. Some of these are:

Absorbents: French Chalk, Fuller's earth, moong powder, besan, talcum powder, magnesium carbonate, etc. are used for removing spots from all kind of materials.

Grease solvents: White petrol, benzene, carbontetrachloride, methylated spirit

WHAT YOU HAVE LEARNT



TERMINAL EXERCISE

1. What does the word "laundering" mean?
2. Why is it important to launder clothes?
3. List the two main methods of laundering and their suitability to fabrics?
4. What is a stain? How would you identify a stain?
5. What are the general precautions to be taken for removing stains?
6. How will you remove the following stains from a silk fabric?
   i) Coffee
   ii) Nail Polish
   iii) Blue ink
   iv) Grass
   v) Paan (Betel leaf)
7. List the three basic steps to be followed for laundering any kind of fabric.
8. How will you wash a cotton garment? What precautions will you take and why?
9. Point out the differences in washing the following:
   i) Silk and wool
   ii) Wool and cashmilon
   iii) White and coloured cottons.
10. Answer the following questions:
    i) Why should very dirty cotton fabrics be soaked?
    ii) Why is light pressure used for washing silk?
    iii) Why is vinegar added in the final rinse for silks?
    iv) Why should woolens be dried on a flat surface?
    v) Why should you not use a hot iron for ironing nylon?

ANSWERS TO INTEXT QUESTIONS

27.1 1) i, ii, iii - Refer to text

27.2 1. (i) True (ii) False, syndets are obtained chemically. (iii) True (iv) False, syndets do not leave any deposits on the fabric. Thus, they do not appear dull and grey.

27.3 1. (a) False - Bleach should never be allowed to remain in the fabric, it can cause serious damage.

(b) True (c) True

(d) True

2. a. bleach b. cotton c. oxalic acid

d. Hydrogen peroxide e. Reducing bleach.

27.4 1. (i) b (ii) a (iii) c (iv) b (v) d (vi) a (vii) a

27.5 1. (i) mended (ii) coloured (iii) losen (iv) shining (v) undergarments (vi) shade (vii) yellow (viii) buttons (ix) mildew

2. (i) Do not use bleach

(ii) Do not wash.

(iii) Drip dry

(iv) Hand wash (Do not machine wash)

AUDIO

Selection of clothing

VIDEO

Summer dressing

For more information
Log on to http:// www.fabriclink.com/fabriccare.html

28

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INTRODUCTION TO HOUSEKEEPING

Every house, whether private, like yours, or commercial like offices, shops, hotels, hospitals, clubs, etc., needs to be kept clean and tidy, so that it looks inviting to all. This is where housekeeping comes in. Cleaning and maintenance services can be spotted very easily anywhere.

The basic concept of housekeeping has started from keeping a domestic house clean and has gradually come to maintaining high standards of cleanliness and maintenance at commercial levels. Besides this , housekeeping should also contribute to the saving in costs of labour, cleaning material and equipment, furnishings and the like in every type of establishment.

But before we move into the actual working and detailed procedures of this interesting and probably the most important activity of our daily life, it is important to get introduced to the commercial concept of housekeeping, its role and importance, the various functions of housekeeping and the responsibilities of personnel involved in housekeeping services. Besides, it is also important to know the grooming standards of these personnel.

OBJECTIVES

After reading this lesson you will be able to:

- explain the meaning and importance of housekeeping;
- identify the areas which require housekeeping in a building;
- list the personnel involved in housekeeping in commercial establishments and elaborate functions of each personnel;
- explain the need for grooming of personnel involved in housekeeping.

28.1 WHAT IS HOUSEKEEPING?

Housekeeping in simple words means maintaining a house on a daily or long term basis or looking after its cleanliness, tidiness, upkeep and smooth running. When you keep your house clean and well maintained, you would also like to make it as beautiful as possible. How do you make sure that everything in the house is in usable condition? None of the objects are broken or chipped and fabrics are not torn. All the fixtures like taps, geysers, electric wiring, bulbs, tubes, fans, plug-points, are in good working condition, geysers are not leaking, electric wiring is proper and there is no danger of fire due to short circuiting, and so on.

Thus, the different procedures followed to keep and maintain everything in the house in a good and presentable order, are collectively known as good housekeeping. In other words, we may also say that housekeeping is a process of keeping a place clean, beautiful and well maintained so that it looks and feels pleasant and inviting to all, either living, visiting or working there.

28.2 IMPORTANCE OF HOUSEKEEPING

To know the importance of housekeeping, let us examine the following situation.

Rohan gets up with a backache as his mattress is lumpy.He has to catch a train; he opens the tap for bathing but there is no water! He goes to the roof to check the tanks, a leak in the pipe has drained out all the water!

He sits for his breakfast and manages to save himself from falling, as the chair is broken. To his horror, he notices a tiny cockroach in his food.

Now, would you like to be in Rohan's place? Would you like to use a dirty toilet? or wear dirty, torn clothes? Would you like to work in a shabby, dirty place? If eating out, would you like to go to a restaurant with broken furniture or pests crawling all over? Would you like to sleep on a dirty and lumpy bed?

I am sure the answer to all the above is 'No'. These are very small things but can make a lot of difference in your daily life. These small things are the very essence of a good housekeeping. Had Rohan attended to the leak in time, repaired the dining chair when it had just started creaking, or unclogged the drain the first time it showed minor blockage, regularly disinfested his house at periodic intervals,— it would have ensured a clear, comfortable environment in which Rohan would have been happy and relaxed. He would not have felt uncomfortable, depressed and frustrated or suffered from an inferiority complex. A good housekeeping would have ensured smooth functioning of all gadgets, no leaks, a comfortable environment in which Rohan would have enjoyed a hassle free living. Thus housekeeping means attending to the small tasks in time.

Activity 28.1

1) Observe your own house and make a list of areas that are : -

- Well maintained
- Neglected.

28.3 AREAS OF HOUSEKEEPING

You must have understood by now how important good housekeeping is to your own house. Similarly, it is equally important for any other kind of establishment, be it a shop, a trading center, an office, club, guesthouse, hospital, hotel or a hostel. Every area in the establishments mentioned above needs to be kept clean and tidy and everything placed here has to be in a presentable and working condition. Thus, housekeeping is an essential and regular feature in all types of establishments.

In commercial establishments, the housekeeping services are done by a team of specialized people according to different areas. Here is a detailed list of areas which need housekeeping. You can add to the list if you like.

i) Rooms and corridors: - ceiling and wall paint, wall paper, fans, air-conditioners, electrical switches and sockets, wiring, windows, doors, glass panes, bed, bed-making, carpets, locks, keys, etc.

ii) Toilets: - taps, sinks, water closet, geysers, water supply, electrical sockets and switches, supply of towels, toilet paper, toiletries (soap, shampoo, etc.)

iii) Linen: - linen (table napkin, tablecloth) towels, bed sheets, bed covers, blankets, garments of guests, staff uniforms, etc

iv) Furniture and furnishings: - furniture, curtains, table lamps, tube lights, chandeliers, bulbs, sofas, dining tables and chairs, etc.

v) Gardens: - Plants, pots, lawn (grass), flowers, trees, bushes, hedges, etc.

vi) Public areas: - stair case, corridors, lobby, conference/ seminar room, waiting halls, recreation room, parking area, clubs, swimming pool, offices, common toilets etc.

Activity 28.2

Go around your bedroom, toilet and kitchen. List five things which may require housekeeping.

Area	Housekeeping needs
Bedroom	i) Example: Knob screws of cupboard need to be tightened ii) iii) iv) v)

Notes

Toilet	i) Example: Leaking cistern needs to be fixed ii) iii) iv) v)
Kitchen	i) Example: Chipped door needs to be repainted. ii) iii) iv) v)

INTEXT QUESTIONS 28.1

1. Correct the following statements:-
   a) Housekeeping refers to cooking nutritious meals for your family.
   b) Housekeeping refers only to residential premises.
   c) Housekeeper is a person responsible for keeping the house.
   d) Housekeeping at home is done by maid-servant.
   e) Housekeeping in a big hotel is done by a single person.

2. Given below is a list of areas/appliances. Suggest the kind of maintenance services required for each.

i.	Fan	ii	Tap
iii	Gas stove	iv	Mixer grinder
v	Pipe	vi	Wall
vii	Window pane	viii	Air conditioner
ix	Lawn	x	Bedsheets

Now let us see who is responsible for carrying out the above activities.

28.4 PERSONNEL INVOLVED IN HOUSEKEEPING IN COMMERCIAL ESTABLISHMENTS

Looking at your own home, who is the person most responsible for upkeep of your house? Yes, it is your mother, who may be helped by other family members or a hired help. Similarly, in most commercial organizations, the responsibility of housekeeping is assigned to a person called a housekeeper. She or he is responsible for upkeep and maintenance of the premises. Depending on the size and type of

organization, there may or may not be a separate section meant to look after various aspects of housekeeping. A small shop may depute a single person to look after these aspects. Yet bigger offices, commercial establishments, guest houses, hotels, hospitals, hostels, clubs usually organize a group of people to look after their housekeeping. These groups of people constitute a housekeeping department. Some establishments may also seek outside help and make use of certain agencies which specialize in such kind of work.

Wherever there is separate housekeeping department a proper organisational structure is necessary with different kinds of people responsible for different tasks and some people to supervise them. Let us now discuss the duties and responsibilities of each of them individually.

Housekeeper- the housekeeper is the overall in-charge of the housekeeping department. He or she directly controls all the personnel as well as all aspects of housekeeping. She/ he is responsible for the cleanliness, beautification and maintenance of the premises.

Assistant housekeeper – he or she is responsible for all the aspects similar to that of the housekeeper. In case the organization works round-the-clock, there maybe more than one assistant housekeeper to work in different shifts.

Housekeepers / assistant housekeepers are in turn assisted by the following members. These members also have workers to assist them.

Control desk supervisor : this person communicates with the staff and coordinates with various departments of the organization. He becomes the centre point of all messages, complaints etc., and also keeps records of what work has been assigned to whom and maintains the general follow-up of the same.

Linen storekeeper: he/she is responsible for storage, issue, cleanliness and maintenance of linen. (Napkins, table cloths, bed sheets, bed covers, pillow covers, blankets, curtains and uniforms)

Floor supervisor: for multistoried buildings, each floor is attended by a floor supervisor. He/ she is responsible for the cleanliness and maintenance of the assigned floor which includes rooms, corridors, rest rooms, stair case, etc., for jobs like changing or repairing lights, switches, etc.

Public area supervisor: he/she is responsible for cleanliness and maintenance of waiting halls, lobby, conference/seminar room, recreation rooms, parking area, clubs, offices, etc.

Cloak room in-charge: he/she is responsible for the maintenance and service of common toilets.

Hotriculturist- he/ she is responsible for all the floral and plant decoration as well as the upkeep of gardens in the premises.

Skilled workers- skilled workers like plumbers, electricians, carpenters, painters are needed to do minor repairs. There may be a separate department for maintenance and engineering work and the housekeeping can coordinate with it to do these jobs.

These services are to be rendered with the highest degree of efficiency. Besides this efficiency, housekeeping should also contribute to the saving in costs of labour, cleaning material and equipment, furnishings and the like in every type of establishment.

Activity 28.3: Prepare a list of maintenance activities performed by your mother, father, brother, sister and yourself in your house.

Family member	Activities
Father	
Mother	
Brother	
Sister	
Yourself	

INTEXT QUESTIONS 28.2

I Your relative has been admitted in a hospital. Specify the personnel you will contact in case of following situations.

i. You want the bed sheets and pillow covers replaced.

ii. There is a fused bulb outside your room in the corridor on the 1st floor.

iii. Food has spilled on the sofa of the lobby.

iv. The toilet in the cloak room is dirty.

v. Plants in the garden have dried up.

vi. You wish to file a complaint about general management.

vii. You want to contact the person responsible for the complete maintenance and upkeep of the whole building.

Now that you know about housekeeping personnel, it is necessary to prescribe certain grooming standards for them.

28.6 GROOMING OF PERSONNEL INVOLVED IN HOUSEKEEPING

A well-groomed personality projects a good image and speaks well of hygiene and efficiency. As far as possible, personnel involved in housekeeping should —

- be fresh, well groomed and clean, not half asleep or unkempt in appearance while reporting on duty
- have their hair neatly cut and tied properly
- have nails neatly trimmed
- dress in simple, clean and well ironed clothes
- avoid rings or other jewellery
- use light makeup, in case of women
- use footwear that is light, without heels and noiseless
- be healthy and not suffer from any skin disease, colds, etc
- avoid bad habits such as nail biting, nose picking, leg shaking, sitting on work table, spitting, chewing pan, smoking, etc.
- bathe daily.

If these hygienic standards are not maintained, it can spoil the reputation of the organization.

Activity 28.4 Observe your mother as a housekeeper. List five cleanliness habits that she practices.

INTEXT QUESTIONS 28.3

While travelling, you may have stopped at a road side restaurant/motel. List 8 unhealthy practices adopted by the workers employed there that you may have observed.

TERMINAL EXERCISE

1. What do you understand by the term 'housekeeping'? Why is it important?
2. Identify the maintenance activities required in the kitchen, verandah and lawn of your house.
3. Specify five ways each by which a housekeeper helps in maintaining the bedrooms, corridors, lobby and toilets of a hotel.
4. Reena got employed as a housekeeper. Educate her on 10 personal grooming habits she should adopt.

ANSWERS TO INTEXT QUESTIONS

28.1 1. (a) Housekeeping refers to keeping a place clean, beautiful and well maintained.

(b) Housekeeping refers to commercial as well as residential establishments.

c) Housekeeper is a person responsible for keeping the premises clean and well maintained.

d) Housekeeping at home is done by the home maker (mother), other family members and by any hired helpers.

e) Housekeeping in a big hotel is done by a team of specialized workers.

2. i. Fan- grease, replace bearing

ii. Tap- change rubber washer, tighten nut

iii. Gas stove- change gas knob, clean burner

iv. Mixer grinder- sharpen blades, clean grime

v. Pipe-repair leaks

vi. Wall- repaint, change/ stick back wall paper

vii. Window pane-change cracked window glass, tighten screws of hinges.

viii. Air conditioner- fill gas, clean filter

ix. Lawn- manure, trim, deweed

x. Bed sheets- remove stains, wash, iron.

28.2 i. linen room supervisor

ii. Floor supervisor

iii. Public area supervisor

iv. cloak room attendant.

v. horticulturist

vi. control desk supervisor

vii. housekeeper

28.3 (i) Unkempt appearance

(ii) Picking nose

(iii) Wearing rings

(iv) Sleepy (not alert)

(v) Dirty clothes

(vi) Long nails

(vii) Painted nails

(viii) High heels

(viii) Has skin disease

(ix) Hair not covered

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CLEANING AND CLEANING MATERIALS

We have already discussed in our previous lesson that housekeeping involves cleaning, maintenance and beautification of any premises and that it is one of the most important and regular features in our daily life. Thus we know that any establishment has to be clean, well maintained and presentable at any given moment of time.

But how to ensure well maintained premises? Cleaning is the most important and primary aspect of housekeeping. It is a process of removing dirt, dust and grime by using methods such as dusting, shaking, sweeping, mopping, washing or polishing.

There are certain areas you may clean daily, whereas you may clean other areas occasionally or once /twice in a year. Since there are different types of surfaces like wall, counter tops, marble floors, ceramic tiles, wooden chairs, etc, special cleaning agents are used to clean these specific surfaces. In this chapter, we will discuss these various aspects of cleaning as well as the materials and equipments used for cleaning.

OBJECTIVES

After reading this lesson you will be able to:

- explain the meaning and importance of cleaning;
- identify various methods of cleaning;
- list and use the different equipments, cleaning agents and materials used for cleaning;
- develop a schedule for cleaning and adopt appropriate procedures for cleaning.

29.1 MEANING AND IMPORTANCE OF CLEANING

What do you mean by cleaning?

Cleaning involves **sweeping** floors, **dusting** furniture and other surfaces, **mopping** or washing floors, **polishing** surfaces, articles and accessories, **scrubbing** tiles, sinks, toilets, **disinfecting** drains, **rearranging** cleaned areas and putting things in their specific place. We can say that cleaning is a process of removing dust, dirt or any other undesirable materials like stains, spots, contents of an ashtray, etc.

What happens if cleaning is not done on a regular basis?

Yes, your house will become the breeding ground of insects such as cockroaches, spiders, ants, flies and mosquitoes. It will look dirty and will be most uncomfortable. Living in such circumstances can also lead to diseases such as asthma, bronchitis, etc. Thus, cleaning is necessary for a general presentable appearance and also to ensure good hygienic conditions.

What do you understand by dust and dirt?

'Dust' collectively refers to the loose particles, which are very easily moved by air and settle on any surface. It is easily removed with the help of a dry cloth.

'Dirt' refers to dust which sticks to any surface with the help of moisture or grease. It is more difficult to remove dirt as compared to dust. Dirt has to be removed either with a detergent or any other cleaning agent.

Let us now read ahead of some general methods of cleaning.

29.2 METHODS OF CLEANING

You have already read earlier in this lesson, that dust and dirt can be removed by dusting, mopping etc. Based on these we can describe the cleaning methods as follows-

a) Dusting

You are already familiar with the term 'dust'. But how do you remove dust? **When any surface is wiped with a piece of dry cloth, (duster), it carries the loose dust with it and the process is known as dusting**. This should be done with a clean soft cloth.

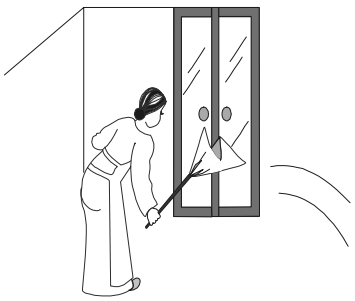

Fig. 29.1: Dusting with a cloth

b) Shaking and Beating

What happens when you shake a cloth full of dust? Yes, the dust falls out. Similarly **when you shake or beat any soft material, like a carpet/rug or a curtain, the dust falls out, making the article dust free to a large extent**. This is mostly done in open air so that other things do not get dusty.

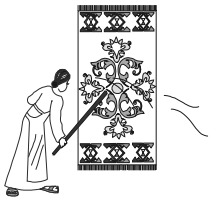

Fig. 29.2 : Carpet being beaten

c) Sweeping

When a broom or a brush is used to carry the dust laterally along the room, the process is known as sweeping. While sweeping any vertical surface as walls, you should remember to start from the top and sweep downwards. Similarly for lateral sweeping as for floors, start from one end of the room and move to another, preferably a door, and carry the dust all along or collect in a dust pan. All the movable articles kept on the floor should be lifted , swept under, and kept back in place.

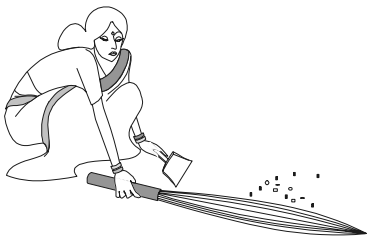

Fig. 29.2 : Sweeping the floor

d) Mopping

You have read that wiping with a dry cloth is dusting, similarly, **wiping a surface with a damp cloth is called 'mopping'**. The piece of cloth used is known as a 'mop' and is generally coarser than a duster. In this process, both the dust, as well as easily removable dirt, is also removed. Mopping is mostly done on floors. Extra attention should be paid to nooks and corners otherwise it gets tougher to remove fixed grime later on.

Fig. 29.4 : Mopping

e) Washing

Sometimes mopping alone is not sufficient to remove dirt. Such surfaces are then **scrubbed with the help of a yard (bamboo) broom along with plenty of water**. Eventually the dirt loosens and is carried off by water. This process is known as 'washing'. In case of tougher stains or dirt, detergent may be added to the water.

Fig. 29.5 : Floor being washed

f) Polishing

When some reagent is rubbed on a surface to bring out the shine, the process is known as polishing and the reagent applied is known as the 'polish'. Similarly, many other articles/ decorative items made of brass, wood, marble etc, may be polished.

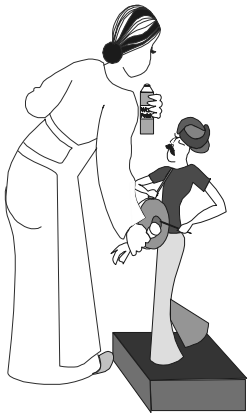

Fig 29.6 : Polishing a statue

Activity 29.1

Observe your home and list the surfaces which are swept, mopped, polished, beaten, dusted and washed.

Method of cleaning	Surfaces
Mopped	
Polished	
Beaten	
Dusted	
Washed	

INTEXT QUESTIONS 29.1

1. Match the methods of cleaning given in Column A with the procedure given in Column B.

Column A	Column B
(i) Mopping	a) beat an article to remove dust
(ii) Sweeping	b) wipe with dry cloth
(iii) Dusting	c) scrub with broom and water
(iv) Polishing	d) dust carried with broom
(v) Shaking	e) wipe with wet cloth
(vi) Washing	f) rub to bring shine
	g) scrub with a broom

2. Differentiate between the following:
   (a) washing and mopping
   (b) polishing and sweeping
   (c) dirt and dust

29.3 CLEANING EQUIPMENTS AND MATERIALS

Let us now learn about the equipment and other materials, which assist us in the process of cleaning. Can you name a few? Let us try to make a list of such equipments.

A. CLEANING EQUIPMENTS

Following are some of the equipments which you will come across during the process of cleaning.

a) **Dusters** - These are mostly made of soft cotton, flannel or artificial feathers mounted on a stick. These are used to clean loose dust and are also used for wiping various surfaces. You should use separate dusters for dusting and wiping surfaces such as dining table, mirrors, kitchen slabs, etc. They should be washed and dried after use.

b) **Dust pans**- these are made of either plastic or metal and have flat surfaces, rounded at the sides. After sweeping, dirt and dust is collected directly into these with the help of a broom and carried to a dustbin. Dustpans save sweeping the entire amount of dust from one room to another. Instead, dust can be collected from each room and disposed of simultaneously. Dust pans should be cleaned after use.

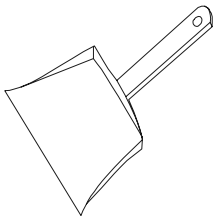

Fig 29.7 : A dust pan

c) **Mops**- are mostly made of thick, loosely woven cotton cloth. These are used to wipe dust from the floors. These are dipped in clean water and squeezed before wiping the floors. You should change the water after mopping each room or when it gets dirty. You should thoroughly wash the mop and spread it for drying, after use.

Fig 29.8 : A mop (with handle, without handle)

d) **Polishing cloth-** these are made of soft absorbent cloth such as flannel. Dry polishing cloth helps to clean and shine the polished surfaces by rubbing them vigorously.

e) **Brooms-** brooms are either soft or hard. The soft ones are used to sweep the floors, whereas the hard ones (yard broom) are used to wash the floors.

Fig. 29.9 : Yard broom, soft broom

f) **Brushes**-are available in various sizes and shapes and are made of different materials. Different brushes are used for specific jobs. Brushes with nylon or plastic bristles are used for cleaning carpets or furniture, round feather brushes are used to remove cobwebs, metal brushes are used to clean wire mesh in the windows. You have special nylon brushes to clean the toilets.

Fig 29.10 : Various types of brushes

g) Buckets or basins- metal or plastic buckets/ basins of suitable sizes are used to carry water, detergents and chemicals so that there are no spills.

h) Dust bins-these are available in plastic with a lid. These should be lined with paper so that the garbage does not stick to the surface. They should be emptied and washed daily.

i) Vacuum cleaner- it works on electricity and has a fan. This sucks in the dirt and dust from the surfaces and stores it in a disposable bag inside. This bag should be emptied regularly.

Fig. 29.11 : A vacuum cleaner

Activity 29.2

Survey the market and collect information about different types of brushes, brooms, mops, vacuum cleaners available.

B. CLEANING MATERIALS

There are many materials and reagents, which help in cleaning, scrubbing and polishing surfaces. Some of these are commercial preparations for cleaning and you may be already familiar with some of them.

a) Water- Water is the simplest cleaning reagent available to us. Some dirt may be loosened and dissolved in it. Although most of the time, some other cleaning agent is also used along with it.

b) Detergents- Detergents are available in powder, solid (soap, soap flakes etc.) and liquid form.These are used with water to clean various surfaces. The basic ingredients in a detergent are surface active agents, known as surfactants. A detergent may have more ingredients to make it more effective, like alkaline salts, bleaches, foam boosters, germicides and perfumes. The exact nature and use of a detergent will actually vary according to its ingredients. However, there are a few points which should be kept in mind while choosing a detergent. It should –

- be readily soluble in water
- be effective in all types of water and produce no scum

Scum- is the grey film which deposits on the fabric with cheap soaps.

Notes

- have good wetting powers so that the solution penetrates between the article and the dirt particles
- have good suspending powers to suspend dislocated dirt and not allow it to settle back
- be effective over a wide range of temperatures
- be harmless to the article and the skin.
- clean quickly
- be easily rinsed away

c) **Abrasives-** some of the common abrasives are sand, finely powdered brick, saw dust, wheat bran, emery paper, fine ash, filtered chalk etc. Besides these, steel wool, nylon mesh, coconut fibers are also used to scrub dirt. Their use depends on the surface to be cleaned and the type of dirt to be removed. The extent of cleaning will depend upon the nature of the abrasive used and on the scrubbing action.

d) **Acids-** strong acids are used to clean toilets (water closet and sinks) and are available in crystals or liquid form. Milder forms of acids are also used to clean very dirty tiles. Acids should be rinsed off as soon as possible after use and should be stored away from children. Vinegar and lemon are used to clean stains on metals like brass and copper.

e) **Alkalis-** baking soda and ammonia are used as grease emulsifiers and stain removing agents.

f) **Bleaches-** stains on fabrics are removed by bleaches such as sodium hypochlorite, sodium perborate, hydrogen peroxide, sodium hydrosulphite etc.

g) **Solvents –** solvents such as methylated spirit, carbon tetrachloride, kerosene, petrol etc; are used to remove grease, wax and other stains from the surfaces. You should keep methylated spirit, kerosene, petrol, away from fire as they are inflammable. Carbontetrachloride is harmful if inhaled.

h) **Polishes-** polishes are used on surfaces such as floors, furniture, leather and even metals. When rubbed on a surface, they provide a protective covering to the surface and produce shine. The article also gets cleaned in the process.

Ready-made polishes are expensive as compared to home-made ones. Recipes of some commonly used polishes are given below. You can easily make them at home.

Furniture cream

INGREDIENTS	METHOD	USE
i. Bees wax 50gm ii. Turpentine 30ml	i. Shred wax and put in a pan. Cover with turpentine. ii. Heat in a double boiler till wax melts. iii. Cool and allow it to set.	Use to polish light coloured furniture.

Furniture polish

INGREDIENTS	METHOD	USE
i. Linseed oil 50 gm ii. Turpentine 30 ml iii. Vinegar 30 ml iv. Methylated spirit 30 ml	i. Mix all ingredients together in a clean bottle and store	i. This can be applied on furniture with a pad of old cloth

Metal polish

INGREDIENTS	METHOD	USE
i. Soap-2 tbs ii. Ammonia-1 tbs iii. Boiling water- 2½ cup iv. Bath brick -50	i. Dissolve soap in boiling water ii. Mix with bath brick and ammonia. iii. Cool and store in air tight bottle.	i. Shake well before use. ii. Soak soft toweling in the mixture, let it drip dry. iii. Wipe and rub with this toweling.

Copper cleaner

INGREDIENTS	METHOD	USE
i. Fine sand- 4 tsp ii. Flour - 2 tsp iii. Salt- 1 tsp	Mix all ingredients and keep in jar. Moisten a small amount of above mixture to a paste by using equal amounts of vinegar and water.	Rub well into brass or copper surfaces to remove stains.

Note : tbs - table spoon; tsp - tea spoon

But before you use polishes, you should keep the following basic principles in mind –

i) Remove dust and dirt thoroughly before polishing a surface.

ii) Use small quantities of polish as extra polish could be harmful to the surface, besides being uneconomical.

iii) Rub off polishes thoroughly as surfaces could otherwise become greasy and sticky.

iv) Surfaces already provided with permanent or semi-permanent polishes should be polished very carefully, so as not to destroy the original shine.

Apart from these equipments and cleaning agents, there are other materials which are used in a cleaning process, such as disinfectants, deodorants, antiseptics, etc. Can you tell where these are used?

Activity 29.3

A. Find out and list the latest equipment and at least five cleaning materials/ reagents available in the market.

Tools/ Equipments	Materials/reagents
i.	i.
ii.	ii.
iii.	iii.
iv.	iv.
v.	v.

B. List the cleaning tools/ equipments and materials /reagents in your house.

Tools/ Equipments	Materials/reagents
i.	i.
ii.	ii.
iii.	iii.
iv.	iv.
v.	v.

INTEXT QUESTIONS 29.2

Given below is a list of reagents. Specify their role in cleaning.

Reagents	Role in cleaning
i. Lemon ii. Jewellery rouge iii. Sand iv. Ammonia v. Methylated spirit	

29.4 SCHEDULE OF CLEANING

Now the important question is how to do cleaning? You must have observed the cleaning process at your own house. Do you clean your rooms completely by removing all the furniture etc, every day? No, because that would require a lot of time and labour which can not be devoted everyday. Then how to do the cleaning? For this, it is important to follow a certain schedule of cleaning.

Everyday, a general cleaning of the open surfaces like floors, furniture and other such surfaces is required. Once in a while some more time is given to cleaning and you probably move heavy furniture and clean beneath it or beneath the carpets. Maybe once in six months or a year you empty the room completely and give it a complete wash, polish the floors, whitewash the walls, ceiling etc.

Thus we can basically divide cleaning into three types of schedules:

a) Daily clean

b) A weekly clean

c) A spring clean

As you have read above, a daily cleaning would be a general cleaning done every day; a weekly cleaning would be a more thorough cleaning done periodically, depending on the frequency of use. In a guest house, hotel, or a hospital, it may be done once a week or even earlier. Spring cleaning is usually done once a year or when particularly needed. It may be earlier in the case of a hospital.

A. GENERAL PROCEDURE FOR DAILY CLEANING

Let us now see how a room is cleaned daily. Can you suggest in what order the work should be carried on?

1. Once you enter the room, open all windows in order to let the fresh air come in.

2. Remove all unwanted articles like tea cups etc., and empty ash trays and dust bins.
3. Sweep the floor.
4. Dust all surfaces including furniture and fixtures.
5. Brush or vacuum clean the carpet.
6. Mop the whole area.
7. Replace linen wherever required, like in a bedroom, make the bed, in a restaurant cover the tables, in bathrooms, check for towels, soaps etc.
8. In the end, adjust windows, do a general survey to see that everything is in order and to your satisfaction.

Similarly the kitchen can also be cleaned in the same way.

1. Collect all used utensils from the counters.
2. Wipe and clean the gas stove, electrical appliances and the counters.
3. Wash all utensils. Drain and store.
4. Sweep the floor.
5. Empty the dustbin, wash, wipe and line it with newspaper.
6. Mop or wash the kitchen with a mild disinfectant.

B. GENERAL PROCEDURE FOR WEEKLY CLEANING

You now know that special cleaning is more thorough than daily cleaning. Let us now see in what order should one work for special cleaning of a room –

1. Start in the same way as in a daily clean – that is, first open all the windows for fresh air.
2. Remove all unwanted articles like trays, teacups, bottles etc. Empty the ash tray and dust bins.
3. Remove all dirty linen.
4. Remove stains from walls, doors, windows and furniture.
5. Check and clean thoroughly, all the drawers, furniture, fittings, all hangings or pictures, lights, etc.
6. Wipe, dust or polish table lamps, accessories, telephone, if needed.
7. Vacuum clean the carpets and other upholstery. If vacuum cleaner is not available, use a brush.
8. Sweep, dust and mop the surfaces.
9. Replace linen with clean linen
10. Survey the room for any discrepancy and adjust windows as desired.

In the case of kitchen,

1. You can empty out the shelves.
2. Clean the jars and bins.
3. Change the newspapers.
4. Rearrange the cupboards.
5. Clean the sunmica on the cupboard door panels with a wet cloth.
6. Clean the tiles.

Can you add some more activities to the above list ?

C. GENERAL PROCEDURE FOR SPRING CLEANING

Spring cleaning is done after long intervals, the frequency being as less as once a year. Thus, it may also be called annual cleaning. It is the most thorough cleaning of a room. Let us now see how a spring cleaning should be done –

1. Ventilate the room.
2. Take off all linen, including curtains and remove them from the room.
3. Remove all the movable articles including lamp shades, pictures, wall hangings etc., wipe and clean everything.
4. If necessary, remove all furniture and furnishings from the room. At least remove soft furnishings like carpets. Clean the cobwebs.
5. Sweep the floors.
6. If any maintenance work is required, this is the right time to do it.
7. Polish the furniture, decorative articles and floors.
8. Clean carpets thoroughly in the sun or send for dry cleaning. Re-lay it.
9. Replace everything at the predetermined place, including all furniture and fixtures.
10. If desired, rearrange the heavy furniture to give a new look.
11. Dust and mop.
12. Adjust windows, survey the room to satisfaction.

In the case of kitchen,

1. Empty out the kitchen.
2. Spread the pulses, spices, etc out in the sun.
3. Clean the cobwebs.
4. Clean exhaust fan and light switches.

5. Clean tiles with detergent.
6. Spray insecticides in corners.
7. Wash kitchen counters with hot soapy solution and if needed, polish them.
8. Wipe stains on cupboard doors.
9. Tighten any loose screws.
10. Replace newspaper lining in cupboards.
11. Label and arrange all boxes back in place.
12. Wash the floor.

Activity 29.4

You have to clean your bathroom. List two cleaning activities which you would do daily, weekly or once in a year.

Daily cleaning	Weekly cleaning	Spring cleaning
(i)	(i)	(i)
(ii)	(ii)	(ii)

INTEXT QUESTIONS 29.3

1. Prepare a schedule of daily cleaning for your kitchen. Also list two activities you would perform on a monthly and yearly basis in the kitchen.

Daily	Monthly	Yearly
(i)	(i)	(i)
(ii)	(ii)	(ii)
(iii)		
(iv)		
(v)		
(vi)		

TERMINAL EXERCISE

1. What do you understand by 'cleaning'? Why is it important?
2. Explain how you will clean your bedroom and bathroom.
3. You have to clean your kitchen tiles, marble wall surface and cement floor.

List the cleaning agents and equipment will you use. Describe the cleaning procedure for the same.

4. Sheila is cleaning her room. Describe six methods of cleaning she may adopt. List the materials and equipments she may use.

WHAT YOU HAVE LEARNT

1. Cleaning is a process of removing dust, dirt or any other undesirable material and disinfect and rearrange the area.
2. Cleaning is necessary for appearance, comfort and hygiene.
3. methods of cleaning - (a) Dusting (b) Shaking and beating (c) Sweeping (d) Mopping, (e) Washing, (f) Polishing.
4. Equipments – (a) Dusters (b) Dust pans, (c) Mops (d) Polishing cloth (e) Brooms (f) Brushes (g) Buckets (h) Dust bins (i) Vacuum cleaner
5. Cleaning Materials – (a) Water (b) Detergents, (c) Abrasives (d) Acids (e) Alkalis (f) Bleaches (g) Solvents (h) Polishes
6. Schedule – (a) Daily Cleaning (b) Weekly/Monthly Cleaning (c) Spring/Yearly cleaning.

ANSWERS TO INTEXT QUESTIONS

29.1 **1.** (i) e (ii) d (iii) b (iv) f
(v) a (vi) c

2. **(a)** **Washing**-refers to cleaning with lots of free water.

(b) **Mopping**-the surface is wiped with a tightly squeezed wet mop

(c) **Polishing**- article is rubbed with a polish and rubbed with a soft cloth, until it shines**.**

(d) **Sweeping**- dust of floor is cleaned with help of a broom

(e) **Dirt**- loose particles easily moved by air and settle on any surface is called dirt.

(f) **Dust**- particles stick to any surface.

29.2 i) Lemon – clean stains from metals

ii) Jewellery rouge – clean jewelry

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iii) Sand – clean hard surface

v) Ammonia – grease emulsifier, stain removing spirit

vi) Methylated spirit – grease solvent, removes grease stains

29.3 I. Daily activities–

i. Open windows and lights
ii. Remove unwanted dirty utensils
iii. Clean work surface and gas stove
iv. Wash utensils
v. Wash/mop floor
vi. Arrange utensils in respective place
vii. Switch off lights

II. Monthly activities–

i. Clean tiles
ii. Change newspapers in cupboards
iii. Arrange cupboards
iv. Clean drawers
v. Remove cowebs

III. Yearly activities–

i. White wash /pint walls.
ii. Polish marble floors/counters.

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MAINTENANCE OF PREMISES

If you look around in your house, you may come across stained floors, dirty walls and work surfaces, torn wall paper, unpolished accessories, scratched tables and many more. Is there any way we can maintain these on a regular basis? Can all surfaces be cleaned with just water and detergent? Definitely not! In this lesson you will read about cleaning and maintaining different surfaces.

OBJECTIVES

After reading this lesson you will be able to:

- identify different surfaces in the house;
- clean and care for different surfaces used in walls and floors;
- clean and care for glass, metal and wooden surfaces;
- carry out routine repair work in the house for electrical equipment and plumbing units.

30.1 SURFACES

You must have noticed that your walls, floors, counters, tables have different textures. Do you clean them in the same manner? No. Every surface is different and needs specific maintenance. These surfaces can be hard such as wood, ceramic, metals, marble etc. They are also semi hard, such as linoleum, plastic, paper etc. Then there are soft surfaces such as upholstery, jute, linen etc. For convenience we will study about these surfaces according to their use.

30.2 CLEANING AND CARE OF WALLS AND FLOORS

Walls and floors are mostly made of cement and concrete or even plastered with mud. Walls may either be painted / white washed or some may be covered with wallpaper, ceramic tiles, fabric or wooden panels. Floors may also be made of marble, granite, mosaic chips, or wood. Maintenance and precautions to be

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adopted for some of the commonly used surfaces on walls or floors have been discussed in the table below.

Table 30.1 Cleaning walls and floors

Surfaces	Maintenance	Precautions
Painted surfaces	i. Dust and remove the cobwebs regularly ii. Sponge with warm water and detergent from top to bottom iii. Rinse with clean, fresh water.	i. Never rub the walls vigorously or scrub with coarse abrasives and brushes. ii. Never use strong chemical solvents
Wallpaper	i. If torn, you should immediately gum it back in place. ii. Rub stains with a piece of soft damp cloth or a sponge. iii. Wipe, if the paper is washable. Use grease absorbers like talcum powder, Fuller's earth, bran, etc., to remove any grease stains.	i. Never scratch the wallpaper.
Ceramic tiles	i. Clean regularly with hot water and detergent. ii. Remove stubborn stains with water sand-paper along with hot water and detergent. iii. Special chemicals are available for cleaning them.	i. Do not use too much of acids as they may become loose and come off. ii. Acids should be rinsed immediately after use.
Marble/granite/ mosaic/cement	i. Clean with hot water ii. Occasionally clean them with kerosene oil and sawdust. iii. Rub with lemon juice to keep the marble white and stain free.	i. Wipe corners and sides sides daily as they can get black.

3.3 CARE AND MAINTENANCE OF FLOOR COVERINGS

Just as walls and floors have different surfaces and various ways of cleaning them, there are different ways of cleaning floor coverings. It is not necessary that all floors be covered. In fact, in a country like ours, it is felt by most people that the easiest way to keep floors clean is to sweep and mop them. However, in most commercial establishments, the floors are wholly or partially covered, mainly for convenience and an aesthetic look. What you learn in this section will definitely help you in keeping various floor coverings clean.

Table 30.2 Cleaning floor covering

Surface	Maintenance	Precautions
Carpet	i. Clean carpets regularly. ii. Once a month take it out, turn it upside down and shake it to remove loose dust. iii. Alternatively, vacuum cleaners can be used effectively. iv. Wash colour fast, dirty carpets with soap solution. Work a lot of lather into the carpet with a brush, using circular motions over small areas at a time. Rinse thoroughly with sponge and dry it in the sun.	i. Put naphthalene balls in rolled up carpets. ii. Air them at intervals. iii. Dry thoroughly before rolling. iv. Remove any stains immediately.
Vinyl/linoleum	i. Clean with wet cloth. ii. Rub stains with a mild detergent.	i. Do not soak with water. Take care to squeeze out excess water from the mop before wiping. ii. Scrub the corners regularly. iii. Do not use hard abrasives and srubbers. iv. Avoid washing soda or alkali as it tends to stick.

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Coir is made up of coconut fibre.	i. Clean it daily with a coarse broom or brush. Occasionally take it out, turn upside down and shake to remove the dust. ii. If it gets very dirty, wash with soapy water, rinse in cold salty water and dry completely in open air.	i. Do not let it get very dirty. ii. Dry completely.
Doormats	i. Turn it upside and beat with a wooden stick. ii. They can be washed with soapy water, rinsed and dried in the sun.	

Activity 30.1

Make a daily, weekly, and monthly plan of cleaning your cement and marble floor, painted door , carpet, coir rug, bathroom tiles.

Surface	Daily	Weekly	Monthly
i. Cement floor			
ii. Marble floor			
iii. Painted door			
iv. Carpet			
v. Coir rug,			
vi. Bathroom tiles.			

3.4 CLEANING OF WOODEN SURFACES

Wood is used for furniture, counter surfaces in the kitchen and floors. It is finished in a number of ways so that its pores get sealed. It also needs to be treated for protection against white ants. If left untreated, it is likely to develop permanent marks on account of dirt, oil and other spills.

Table 30.3 Cleaning wooden surfaces

Wooden Surface	Maintenance	Precautions
Plain wood (chopping boards, pastry boards, rolling boards and pins)	i. Wash with mild soap and warm water. Rinse and dry in open air. ii. Extra bits of food sticking to the board can be removed by using the back of a knife.	i. Always scrub along the grain. ii. Never use hard scrubbing brush. iii. Avoid soaking in water. Never use very hot water as the wood will swell. iv. Avoid strong cleaning agents.
Polished wood	i. Dust and rub with a flannel cloth. ii. Remove water marks by rubbing methylated spirit/ turpentine or a mild solution of ammonia.	i. Avoid spilling on wood. ii. Wipe spills immediately.
Painted wood (doors and windows)	i. Clean with mild soap and water. Rub dry with a flannel cloth to give it a gloss. ii. Repaint periodically to preserve it better.	i. Ensure that all traces of soap are carefully removed, otherwise, stains may still seen on the surface.
Laminated/veneer surface (sunmica)	i. Wipe clean with wet cloth. ii. To remove heat marks, rub metal polish and wash up with mild detergent. Use wax polish or creams to protect veneer surfaces.	i. Avoid scratching and using coarse abrasives. ii. Wipe all spills immediately to avoid permanent staining.

3.5 CARE OF METAL SURFACES

Utensils/ appliances – may be made of copper, brass, glass, steel, silver, iron, etc. Brass and copper form a poisonous tarnish- a blue-green colour, in humid climates. We would need to maintain each of these surfaces in a different way, some of which have been discussed below.

Table 30.4 Cleaning metal surfaces

Surfaces	Maintenance	Precautions
Brass and copper	i. Use soaps and cleaning powders with mild abrasive action. Rub lemon juice and salt, vinegar or tamarind pulp along with fine steelwool. Use sifted ash to clean utensils at home . ii. Clean engraved brass with an old tooth brush. iii. Use 'Brasso' or mild solution of the hydrochloric acid to clean very dirty ornamental articles.	i. Never use brasso or other chemicals to clean cooking utensils as they are poisonous.
Silver and silver- plated used for tea pots, trays etc.	i. Wash with warm, soapy water immediately after use. ii. Protect from getting tarnished by covering them individually with tissue paper. iii. Scrub lengthwise with a soft cloth. iv. Remove any tea stains by using 2 table spoons of soda and boiling hot water. Rub decorative articles with 'Silvo' (a polish available in the market).	i. Do not use any coarse abrasives as it gets scratched easily. ii. Use mild abrasives.
Steel	i. Clean with cold or hot water along with detergent. ii. Scrub badly stained pans with mild abrasives. iii. Soak burnt steel utensils in saline water (add salt in water) and scrub with mild abrasive.	i. Do not use hard abrasives as the steel gets scratched.
Iron	i. Clean soon after use. ii. Smear oil on the surface to seal it. iii. Remove stains by using brick powder, bran, saw dust etc.	Dry completely as moisture can result in rusting.
Non stick/ Teflon coated (tava, pans, snack toasters, saucepan)	i. Smear oil before use. ii. Rinse immediately after use. iii. Clean with sponge and soapy water, rinse and dry.	Do not use steel wool or hard abrasives.

3.6 CARE, CLEANING OF GLASS, CANE AND

PLASTIC

Glass is used for windows, table tops, partitions and sliding doors. Cane is light-weight and mostly used in chairs and tables. Plastic is used in bottles, mugs, buckets etc.

Table 30.5 Cleaning of glass, cane and plastic

Surfaces	Maintenance	Precautions
Glass	i. Clean with a wad of newspapers and water. ii. To give it shine, rinse it with water in which vinegar is added. iii. Remove grease stains with ammonia in warm water. iv. Remove fly specks by rubbing with methylated spirit.	i. Do not use hard scrubbers and abrasives, as it will result in scratches.
Cane	i. Regularly dust and clean to eliminate bugs, spiders, and cockroaches in corners. Use a brush to reach the corners. ii. Wash it with warm salty water (1 Tb spoon salt in 1 litre water) Then dry it completely in open air . iii. Coat with clear varnish to prevent staining. It can also be polished with liquid wax polish.	i. Avoid soaking in water.
Plastics	i. Remove stubborn stains by applying kerosene oil and if possible, put it out in the sun.	i. Do not use strong abrasives as they tend to scratch the surface. ii. Do not use chlorine.

Activity: 30.2. Practice cleaning any of the following surfaces – wooden chair, glass window, brass vase, plastic bucket, ceramic mug, cane basket, plastic table cloth, kitchen slab.

INTEXT QUESTIONS 30.1

1. Radha is confused. Help her match the agents (given in column I) used to clean the following surfaces (given in column II).

Column I	Column II
a) grease stains on glass	(i) linseed oil
b) water marks on wood	(ii) kerosene oil
c) linoleum	(iii) soda and boiling water
d) stubborn stains on plastic	(iv) ammonia
e) Tea stains on silver	(v) alkali
	(v) mild detergent

2. Sheela has the following problems in her house. Suggest ways to clean them.
   (i) Dirt stains on wall.
   (ii) Turmeric stains on marble slab.
   (iii) Grease stains on wallpaper.
   (iv) Water marks on ceramic tiles.
   (v) Heat marks on laminated table.

3.7 ELECTRICAL REPAIRS

Apart from keeping the premises clean and well maintained, you also need to be familiar with some general equipment and appliances, so that if required you may repair them or supervise their repair. In this section we will study how to repair some electric gadgets. You must remember one thing clearly, if any electric appliance stops functioning, the first thing to check is the electric supply to it. You must also be careful when handling such appliances. Whenever attempting a repair work, make sure that the appliance is disconnected from the main supply, by removing the plug from the switchboard socket.

IMPORTANT WARNING

- ALWAYS WEAR RUBBER SLIPPERS.
- ALWAYS DRY HANDS COMPLETELY.
- ALWAYS KEEP A WOODEN PLANK/ WOOLLEN BLANKET HANDY.
- ALWAYS DISCONNECT THE MAIN SUPPLY /UNPLUG THE APPLIANCE

Electrical Fuse

You must be quite familiar with an electricity fuse. A fuse is made of a thin metallic wire, normally of a tin, lead and zinc alloy. Some times, due to a short circuit , or a faulty appliance, this wire melts and the fuse blows. Once it blows, you can carry out the following steps –

a. Put the main switch off.
b. Identify the faulty appliance, switch off and remove it.
c. Take out the fuse cut out and examine it. You will see the melted wire or its remains. Remove this wire and clean the cut out/carrier.
d. Replace with a new wire. The new wire should pass through the hole if one is provided.
d. Replace the fuse cut out, close the box and put the main switch on.

3 pin plug

These plugs are mostly of two sizes : either 5 or 15 amperes. Due to high current they sometimes melt, thus exposing raw wires which can lead to electric shock. This plug consists of 3 wires : one for positive, another one for negative and the third one for earthing (neutral). Usually different colours are used to differentiate between them. Green colour is mostly chosen for earthing, red for positive and yellow or some other colour is chosen for negative (these colors can vary).

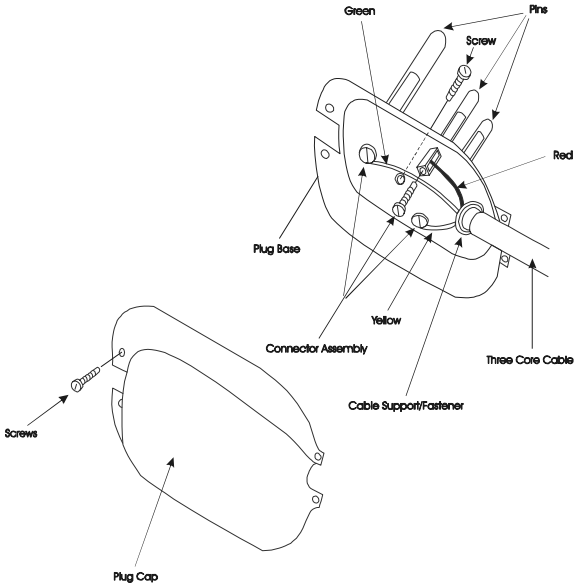

Fig. 30.1: Changing the plug

To change the 3-pin plug, follow the given steps:-

a. Unscrew the main screw placed in the middle of the plug.
b. Unscrew the small screws on each of the three wires and pull them out.
c. If needed, expose the inside wires by scraping the outer plastic coating with a blade or a sharp knife.
d. Replace with a new plug, put positive in one screw band and negative in the other screw band, parallel to it. Tighten the screws. Make sure the two do not touch each other.
e. Put the neutral wire in the lower screw band and tighten the screw.
f. Put the cover and tighten the main screw.

Notes

Fans

Fans are one of the most common electric appliances one comes across in daily life. In case a fan stops working, usually you must call an electrician. But there are some points which you may try yourself.

a. Proper oiling and greasing must be done regularly. Most of the time you will find holes provided for oiling, especially in table fans.

b. If a fan stops working, switch it off, try rotating its blades with the help of a wooden stick. Stop once it is set in motion and switch it on. If it picks up speed, its capacitor needs to be changed; if it does not, check the electricity supply. Help of an electrician may be needed.

c. If it makes noise, it is usually because of worn out bearings. This happens due to lack of lubrication. The bearings must be changed and lubricated periodically.

Room Coolers

Room coolers consist of a cabinet, a water pump and an exhaust fan. The air first passes through the wet cooling pads and then this cool air is thrown in the room. The fan needs attention, about which you have already read. Let us now go through certain other points of attention.

a. The cabinet must be well cleaned before installation and also periodically, when in use. If it is made of iron, it should be painted to avoid rusting.

b. The cooling pads, which are made of grass wool or 'khus-khus' should be changed every summer.

c. Pump and the fan must be lubricated before summer.

d. The water inlet in the pump should be covered with a filter, usually wire mesh, to prevent the entry of grass wool or 'khus-khus' particles, which may clog the water pipe.

e. Care should be taken that the water is always above the minimum level, otherwise the pump will be damaged.

f. Whenever water is being filled in cooler, make sure that the electricity supply is switched off.

Room Heater

The main part of a room heater is the heating element, which gets heated when electric current passes through it. The heating element can be easily replaced by removing the screws which hold it. You must keep in mind that the body should be periodically cleaned to maintain a smooth shiny surface so that maximum heat gets reflected.

3.8 PLUMBING FAULTS

You have read about some electric faults. You must also be aware of certain utility items of plumbing nature. Let us go through the most common ones.

Taps

The two major things involved in the water supply are the pipeline and the tap. If a pipeline is faulty or leaking, you can only give a temporary treatment to it by tying a cloth or taping the leaking part; but you have to call a plumber to rectify it permanently. Taps normally show only one kind of fault and that is when they start leaking. If it happens, you need to change the washer. You can carry out the following process-

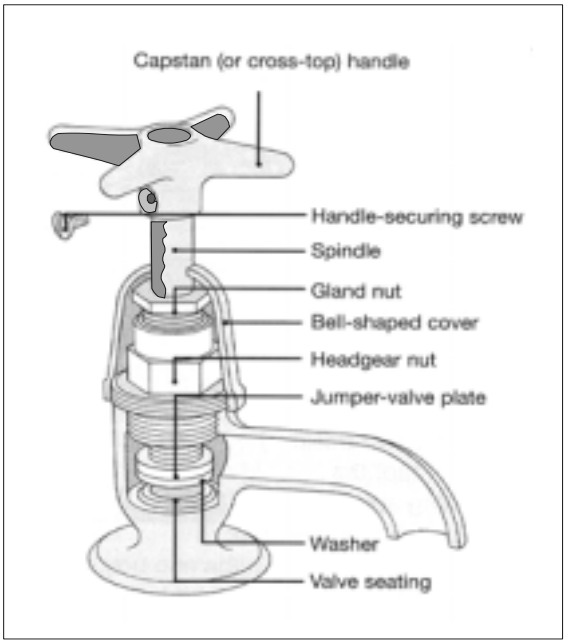

Fig. 30.2 : Changing the washer

a. First stop the water supply by turning the mains off.

b. Unscrew the hand-wheel.

c. Remove the hanger. For this you will have to use two wrenches, one to hold the lower part of the body and with another, unscrew the headgear. You may use a padded wrench for the lower part to avoid scratches.

d. Once the headgear is removed, you can access the stem holding the washer. Take it out. Remove the washer.

e. Replace the old washer with the new one and place the stem back.

f. Close the tap, fixing the headgear in place and then the hand-wheel.

Flushing Cistern

To be able to maintain this, you must first know how it works. Please refer to the figure as you read the text. When the lever is pulled down, the bell shaped unit rises up releasing the passage for the water to flow into the pipe. With the water flowing down the pipe, vacuum is created pulling more water from the tank, and pushing it down. This process continues till all the water in the tank gets over. As the water level decreases, the ball/float valve goes down thus releasing the inlet

Notes

valve so that the water starts filling the tank and the ball valve starts rising. At a predetermined level, the valve has risen enough to close the inlet valve and the water stops entering the tank. The cistern is ready for fresh use.

Now, what kinds of faults can develop in this system? Let us go through some of them and how they may be rectified.

a. The washer in the inlet valve can develop a problem which can be repaired in a similar way as taps.

b. Sometimes the valve gets jammed due to impurities in the water supply, then it has to be opened and cleaned.

c. The impurities in the water may settle down in the tank and hinder the ball from settling properly. To avoid this, the tank needs to be cleaned periodically.

d. The operation of inlet valve is governed by the ball valve. Sometimes the ball may corrode or puncture, thus may not rise with the water level. Then you may have to change the ball.

Activity 30.3

Practice changing the following in your house:

i. Electric fuse.

ii. 3 pin plug of an iron.

iii. Washer of a tap.

INTEXT QUESTIONS 30.2

1. Geeta finds following faults in her gadgets. Help her to identify the exact causes.

   a. Electricity Fuse

   b. Noisy fan

   c. Fan rotates at extra fast speed

   d. Leaking tap

   e. Ball valve in cistern does not rise with water level and water overflows.

1. Give suggestions to maintain the following at home.

a. Carpets b. Wooden surface c. Brass

d. Glass window e. Cane chair

f. Coir flooring.

ANSWERS TO INTEXT QUESTIONS

30.1 **1.** a) iv b) i) c) vi) d) ii) e) iii)

2. (i) Wash with warm water and detergent with sponge from top to bottom. Rinse with clean water.

(ii) Clean with hot water and detergent. Rub lemon.

(iii) Apply any grease absorber (talcum powder, bran, etc.), brush off after a while.

(iv) Water and detergent, if needed along with sandpaper or mild acid. Rinse immediately.

(v) Rub a little metal polish. Wash with mild detergent.

30.2 (a) Wire in cut-out melts on passing heavy current.

(b) Bearings worn out

(c) Capacitor needs to be changed

(d) Washer needs to be replaced.

(e) Ball valve may have corroded/punctured.

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AESTHETICS AT HOME

Apart from keeping any accommodation neat, clean and comfortable, there has to be something more added to it, to make it inviting and give a welcome and pleasant look. You must have visited some hotel and found everything there, i.e., the draperies, sofa, carpets, paintings very beautiful. Appropriate wall paintings, floor decorations, flower arrangements and accessories can add to the décor of any accommodation. But this does not mean that all beautiful and expensive things available in the market, when put together will give a beautiful room. You can buy less expensive items and arrange them in a decorative manner. For this, all you need to learn is to make the right selection and arrange them at appropriate places. In this lesson, you will read about various ways of decorating your house.

OBJECTIVES

After reading this lesson you will be able to:

- explain the importance of arranging things in the house in an orderly and decorative manner;
- arrange flowers artistically;
- create appropriate floor decorations;
- suggest ways to beautify the place by arranging decorative items attractively in the house.

31.1 IMPORTANCE OF AESTHETICS AT HOME

Cleaning also involves putting the things in place. For this, a specific place is decided for every household item. What happens if such type of cleaning is not done on a regular basis?

Yes, you can never find things on time. You waste time trying to find them. When in a hurry, you may topple half the things and leave a mess behind. More things get misplaced, more time wasted and this cycle goes on…. You will find yourself always running short of time, unorganized and unsystematic.

On the other hand, if all the things are kept clean and are in their proper place, you will have no such problems and meanwhile you will also save a lot of time and energy.

Imagine yourself living in a house which is clustered with furniture and paintings, and curtains that are not matching. There are too many decorations in the showcases. There is hardly any space to move about, as a result your movements are restricted. I am sure you would not like to live in such a house.

On the other hand, picture yourself in a home in which the furniture is proportionate to the size of the room.Other objects are well arranged; curtains give uniformity to the room; colours create an informal atmosphere and are pleasing to the eye; the lighting is adequate and there is enough space for free movement. Living in such houses is a pleasure.In all, you feel rested and comfortable.

Thus we see that if the rooms are arranged beautifully and at the same time, satisfy our needs of work, we can derive optimum satisfaction from them. One has to provide an artistic touch to make the same things look beautiful as well as comfortable.

So you see, if you have good taste and understand art, you can decorate any room in a desirable and pleasant way.

31.2 FLOWER DECORATION

You must have seen flowers decorated in the halls of marriage parties or hotels. Don't you think they look beautiful? You too, can make flower decorations with whatever locally available materials you have.

Whether it is an informal party, a formal dinner, an office, a conference room, a living room, a bedroom etc., all will call for different kinds of flower arrangements. Thus, the purpose of composing an arrangement and the atmosphere of the surrounding should always be kept in mind. For this, it is important to know various aspects of flower arrangements.

1. Collection of materials

First you need to collect materials such as flower vase, pin holder or oasis, fresh or artificial flowers, green leaves, twigs etc.

Fig. 31.1 Vases, pin holder, oasis

i. Vases come in different materials and colours. You can also make your own vase with a flat pot, hollow of a wood etc. Vases should be chosen so as to match the surrounding décor and mood. For a living room having cane furniture and coir coverings, a small basket as a vase will be more suitable than a porcelain one. A contrasting vase or one matching the flowers creates harmony in a flower arrangement.

ii. Normally odd numbers of flowers are used in any arrangement. You can use as less as three flowers (as in case of ikebana- a Japanese art of flower arrangement). You should choose flowers of varying sizes.

iii. You can also use natural looking, artificial flowers with fresh leaves to give a natural look. Use of fresh green leaves besides adding beauty and giving background to the flowers, can help the arrangement to resemble nature.

iv. Pin holders are iron nails fitted on to a heavy metal base. These should be closely spaced, rust free and should be long enough to hold stems of flowers and leaves.

v. Alternatively, a device known as oasis is also available in the market. This can absorb a lot of water and keep flowers moist. These should be soaked in the water until the air bubbles disappear and water enters right up to its core. These can be reused 2-4 times. Oasis is easier to handle for beginners who may find it difficult to balance flowers in pin holders.

vi. Twigs help to enhance and give a natural look to the arrangement. These twigs can be collected from curved branches, roots, etc.

vii. Leaves are used to fill up space between flowers and should be washed if dirty. Trim off unwanted, wilted and brown leaves. Some foliage can be used instead of flowers.

2. Method of flower arrangement

To arrange the flowers, one needs a lot of imagination. Observing nature and copying it can be a good start for beginners. Follow these tips for help.

i. Fix pin holder to the container and pour water into the container until it covers the pin holder. Alternatively, soak the foam/oasis in water till it is saturated and then place it in the vase.

ii. Decide the shape of flower arrangement. It can be a triangle, right angle, oval, S shaped etc.

iii. Choose five flowers of different sizes in one colour. You can also experiment with contrasting flowers or with flowers which compliment each other.

iv. Pluck flowers early in the morning, before they mature. All cutting and nipping should be done under water.

v. Cut the stems of flowers at different lengths. The tallest branch should be cut to the length which is at least 1 ½ times the width of the vase.

i. First arrange the tallest flowers and then other flowers in order of their height.

ii. Place the second branch cut little shorter, away from the first one and so on.

iii. You should always push the branch firmly inside a pin holder or an oasis so that it stays in place and does not fall down.

iv. Add the flowers at different heights, ensuring enough space in between.

v. Face the flowers towards yourself so that you can enjoy their beauty.

vi. Put bigger flowers towards the bottom, medium sized in the center and buds at the top of the arrangement, so that it does not look top heavy.

vii. Fill the gaps with appropriate leaves of different sizes.

viii. Hide the pin holder/oasis with leaves, stones etc.

ix. Place the arrangement against a contrasting background from where all the flowers can be viewed.

INTEXT QUESTIONS 31.1

I. You are arranging flowers in a vase. Correct the following statements: -

1. To ensure freshness, flowers should be plucked in the evening.
2. Even number of flowers should be chosen.
3. Pin holders are used to keep pins.
4. All flowers should be of the same height.
5. Buds should be placed at the bottom, medium sized flower in the middle and largest sized flower at the top of the arrangement.

II. Fill in the blanks: -

1. In a flower arrangement, green leaves help to ————————, ———————— and ————————————nature.
2. Tallest stem in a flower arrangement should be ———— times taller than the vase.
3. Flower arrangement should be placed against a ———————— coloured background.

31.3 PRINCIPLES OF FLOWER ARRANGEMENT

While arranging flowers, you have to follow some basic principles.

i. The size of the flower arrangement should be proportionate to the room or other articles in the room like the table on which it is kept, other decorative

articles in the room etc. The plant material should be proportionate to the size of the container. You have already learnt that a large flower would look odd in a small vase and vice versa. The flower material should be 1 ½ times higher than the height of the flower vase.

ii) The whole arrangement should be balanced. It should neither be top heavy nor lopsided.

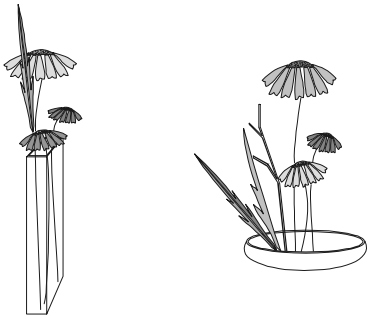


Fig. 31.2 : Top-heavy, lop sided flower arrangement

iii) Your eyes should be able to travel easily round the whole design and should not stop moving. For this, the basic shape, colour, texture should be repeated at intervals. For example, if curved plant material is used then combine it with a curved container. This can also be achieved if you arrange flowers at different heights.

iv) Flowers of different sizes should be placed gradually from fully bloomed to buds.

v) Keep the stem ends close together. This would give the arrangement a natural look.

Fig. 31.3 : Flower arrangement

vi) The plant material should look more important than the vase. All parts of flowers should not attract equal attention. Larger, bright flowers always attract the eye, so too many different coloured flowers should not be put in the same arrangement. Instead, some small and dull colour flowers can be put along with brightly coloured flowers.

vii) To emphasize the shape of twigs, flowers should either be placed higher or lower than the curves of twigs. Allow space around each flower.

viii) The flowers, leaves and vases should harmonize and complement each other.

Activity 31.1

Make flower arrangements for a

i) Dining table

ii) Corner table in a living/drawing room

iii) Bedroom

After arranging these flowers, evaluate your arrangement by asking yourself the following questions –

(i) Does the arrangement look balanced or does it appear too heavy on the top or too heavy on one side?

(ii) Is it firm or wobbly?

(iii) Do the container and flowers suit each other?

(iv) Is it overcrowded or is there enough space between flowers?

(v) Are my eyes equally attracted to all parts?

(vi) Do my eyes travel smoothly from one part to another?

(vii) Can I see the face of all the flowers or are they facing the wall or back?

INTEXT QUESTIONS 31.2

Assess a flower arrangement for the following –

1. All flowers are placed at the same height.
2. Large flowers are placed on the top.
3. All flowers and leaves are placed towards the left

31.4 FLOOR DECORATIONS

In earlier days, people used to decorate floors by making different designs with the help of various colours and flower petals. They also used powders like rice or maida. This traditional method of decoration is still prevalent and is known as 'Alpana' or 'Rangoli'. You must have seen at your home also, women make drawings of animals and other shapes, on festive occasions. Rangolis are generally made on the doorsteps, courtyard or verandah of the house. You can also design a rangoli pattern and draw it on the floor with the help of a chalk. Then you can fill it up with petals, dry powdered colour, etc. Outlines can also be drawn by using flour or rice paste.

There are certain points you should keep in mind while making rangoli / alpana.

(i) Select design according to the theme of the festival/occasion.

(ii) Draw the design in double lines so that colour/material can be filled in-between. Ensure uniformity and balance.

Notes

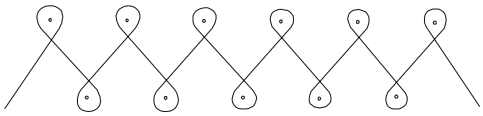
(iii) Use contrasting colours next to each other.

(iv) While filling, use a scale to neaten the outlines.

(v) Fill evenly, press flat to smoothen the material.

(vi) Fill the background, so that the design looks part of the floor.

Some of the designs have been drawn here.



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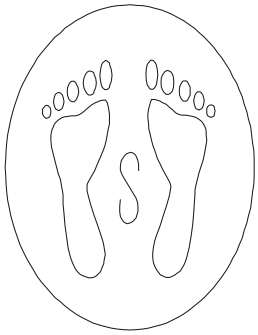
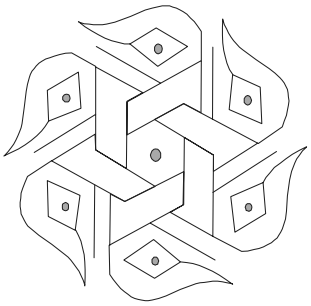
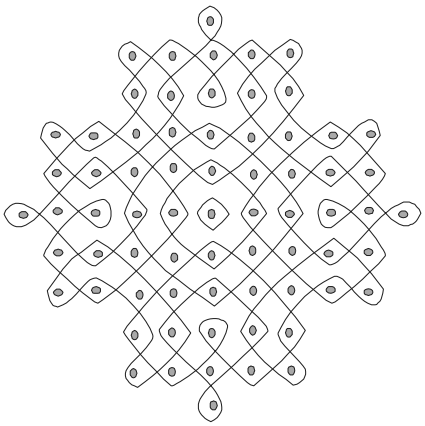


Aipan



Rangoli



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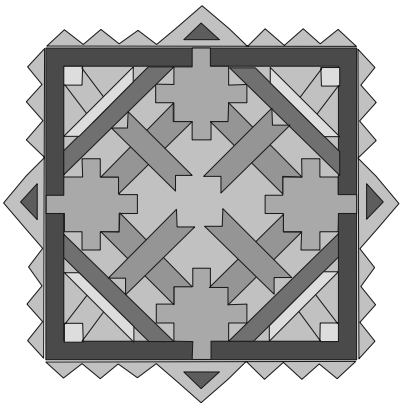

Rangoli

Fig. 31.4 : Designs for Rangoli

You can use sawdust for filling rangoli designs. To colour these, take about 30 gm (2 Tb spoon) dyeing colour in 1/2 glass water. Sieve sawdust and remove all wooden particles. Put the sawdust in a plastic tub. Add colour and mix well. Dry this on a newspaper in shade. Store in plastic bags.

***Activity* 31.2**

i) Colour sawdust in four different colours .

ii) Draw different rangoli designs for festive occasions like Diwali ,New year, Holi , etc.

iii) Make rangoli on floors using flowers, sawdust, grass etc.

INTEXT QUESTIONS 31.3

Using the following words, write tips for making a good rangoli –

i) Theme ii) double iii) contrast iv) even v) flat.

31.5 ARRANGING ACCESSORIES

You might have collected beautiful paintings, wall hangings, table lamps, cushions, and curios. Though each one may be very artistic, if they are not arranged thoughtfully, your house might end up looking cluttered and untidy. While arranging accessories you need to keep the following points in mind.

(i) Hang paintings according to their size and space available i.e., big paintings on a big wall and vice versa. Alternatively a group of small paintings can also be hung together. These can be hung in such a way that the all fit in an imaginary square or a rectangle.

(ii) Paintings can be enhanced by putting spot lights which fall directly on the paintings.

(iii) Hang all paintings straight and even, not lopsided.

(iv) Colour of lamps should harmonize with the décor. These can be placed in corners or hung over a painting to enhance it.

(v) Cushions can be placed randomly to add colour to the room.

(vi) Care should be taken that too many curios are not collected together.

(vii) Similar material curios (like all made of brass, cut glass, white metal, wood, etc) can be grouped and kept together.

Activity 31.3

Practice the following in your house –

i) Hang three to five pictures in your living room wall

ii) Arrange decorative items in a showcase of a drawing room

iii) Place indoor plants

TERMINAL EXERCISE

1. Rahul's friend gave him five yellow roses on his birthday. What other materials would he need to arrange these? Guide him to arrange these for the side table in his bedroom.
2. What points would you keep in mind while arranging accessories?
3. Ritika is expecting her friends. She wants to decorate her room. Give her five suggestions to beautify her room.
4. What points would you keep in mind while selecting and using a pin holder.
5. Enumerate the principles you would adopt while arranging flowers.

WHAT YOU HAVE LEARNT

1. It is important to keep your house not only clean but also beautiful and well arranged so that it is more comfortable also.
2. While decorating the house harmony, symmetry, and uniformity in furniture, lighting and arrangement of accessories should be kept in mind.
3. When arranging flowers consideration has to be given to colour and type of flowers as well as of the vase.
4. 'Alpana' or 'Rangloli' is a beautiful, traditional way of floor decoration. It can be done with either flowers or colours made of rice, flour etc.
5. Pictures, cushions and other artefacts should be arranged according to the size and as pleasing to the eye.

ANSWERS TO INTEXT QUESTIONS

31.1 I. 1. Flowers should be plucked in the morning.

2. Flowers should be odd in numbers.
3. Pin holders are used to hold the flower stems in position.
4. Flowers should be cut at different heights.
5. Buds should be placed at the top, medium sized flower in the middle and largest sized flower at he bottom of the arrangement.

II. 1. add beauty, provide background and make it resemble

2. 1½
3. contrast

31.2 1. There will be no rhythm as the eyes will not move from one place to another and eyes will get stuck at one place.

2. It will look unbalanced and will look top heavy.
3. It will look unbalanced and lopsided. It will appear heavy on the left and empty on the right side.

31.3 (i) Should be according to the theme of the festival or occassion

(ii) Draw design in double lines

(iii) Use contrasting colours.

(iv) Fill evenly

(v) Press flat

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28

CREATIVE HAND EMBROIDERY

All of you must have seen embroidered fabrics at home and in the market. Have you noticed how a few tiny stitches in a variety of threads can magically transform the plain fabrics into an artistic creation? Embroidery has always played a very significant role in the lives of Indian people. It is an art which both men and women have practiced not only to satisfy their creative urges but also to earn a living. It was and is being used to adorn everything from the smallest personal things like handkerchief to cushions, curtains, wall hangings, bed and table linen, various articles of apparel, etc.

You can also learn to embroider but for that you will have to get familiar with some basic information and collect necessary materials and equipment needed for the same. This lesson will introduce you to all these. So let's enter into the world of embroidery and learn about it.

OBJECTIVES

After reading this lesson you will be able to:

- explain the meaning of embroidery;
- recognize the equipment and the materials used for embroidery and elaborate the functions of each.

28.1 MEANING OF EMBROIDERY

Embroidery is the art of creating decorative effects on the surface of a fabric using designs and stitches made with the help of needle and thread. It can be beautifully described as a painting with needle and thread. Our museums contain beautiful pieces of work from all over the world, each of them different but still sharing a

similarity with regard to the use of basic stitches and techniques. Some of the famous traditional Indian embroideries are:

- Phulkari of Punjab
- Kantha of Bengal
- Kasuti of Karnataka
- Chikankari of Uttar Pradesh
- Zardozi of Kashmir
- Sindhi and Kutchi of Gujarat

Remember, these are only a few examples, there are many more embroideries which are created in our country. Do visit the Crafts Museum of Pragati Maidan, whenever you come to Delhi.

28.2 EQUIPMENT AND MATERIALS USED FOR EMBROIDERY

Once you decide to make an embroidered piece, it is important to collect the proper material and equipment which will help you to work smoothly. Not many items are needed; so choose the best you can afford. Good tools produce good work. Learn to use your embroidery tools properly and you will find your work to be the best.

(a) Hand sewing needles: A good embroidery needle is the most important thing required for embroidery. Sized from coarse (#1) to very fine (#10) you must choose the right needle for the right fabric. Use a finer needle for a delicate fabric and vice versa. The needle should be slightly thicker than the sewing thread so that it makes a sufficiently big hole in the fabric for the thread to pass easily. Needles should always have a fine tip so that they can easily move in and out of the fabric. Do not use a needle which is bent, without a point or rusty. This will affect the regularity and neatness of work. Protect your needles by storing them in a needle case.

Fig. 28.1 : Sizes of Needles

Notes

(b) Thimble: This is small light weight metallic piece which fits snugly on the middle finger of the needle holding hand. It protects the finger from getting injured with the needle while pushing it into the cloth. Thimbles come in different sizes. Try on a few for correct fit before you buy.

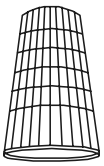


Fig. 28.2 : Thimble

(c) Scissors: Embroidery scissors are small, with sharp, narrow, pointed blades. Protect the blade by keeping them in a sheath or cover and get them sharpened occasionally. These are used to cut and neaten the loose ends of thread. Now-a-days thread clippers are also available. These appear like small scissors or like tweezers with sharp edges, which help in cutting the thread neatly.

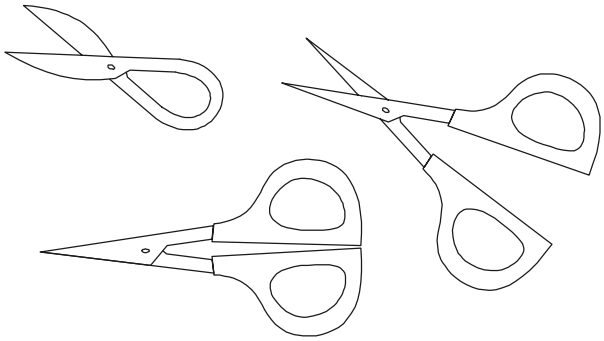


Fig. 28.3 : Scissors and thread clippers

(d) Threads for embroidery: Thread is a very important feature of embroidery. There are a variety of threads available in the market. Different types are used for different kinds of embroidery. The kind of thread used also depends on the end product to be made. Thread may be of cotton, silk, wool or synthetic material. It could have more or less twist. Hence, different threads will differ in fineness and lustre. Some embroidery threads are also available in ply. This means a number of yarns are twisted together. You can pull out and use any number of yarns you require out of that plyed yarn. One ply will give very fine embroidery. If you use all 6 ply it will give a bold embroidery.

In the market embroidery threads are commonly available as cotton embroidery threads, silk floss (also known as *pat)* – it is a low twisted silk yarn which has a lot of shine but low strength, silk thread (resham ka dhaga**)** – it is a twisted silk yarn, has good shine but lower strength than cotton. Woollen yarn can also be very beautifully used to produce good embroidery pieces.

Hence, the choice of thread depends on the kind of embroidery you are creating and the texture required in your embroidery.

(e) Embroidery frames: To get good results embroidery is usually worked using frames. Frames hold the fabric tightly and evenly, hence the stitches are more likely to be neat and accurate than if the fabric were held in the hand while working. There are two main types of frames:–

1. Round frame: This is also known as hoops. It consists of two pieces, a smaller hoop which fits into a larger one. There is usually a spring or screw adjustment to keep them fitting snugly. The fabric for embroidery is placed over the smaller hoop and the larger hoop is pressed over the fabric, fitting it snugly on to the smaller hoop. These frames are either of wood or metal. While framing a very delicate fabric, it is advisable to place tissue paper over the inner hoop or twist or wrap the inner hoop with a thin material to prevent markings on the fabric.

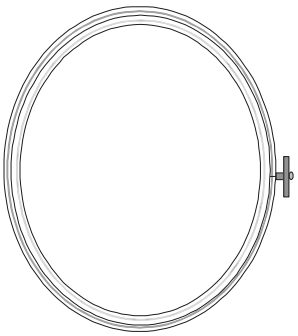


Fig. : 28.4 Round frame (Hoops)

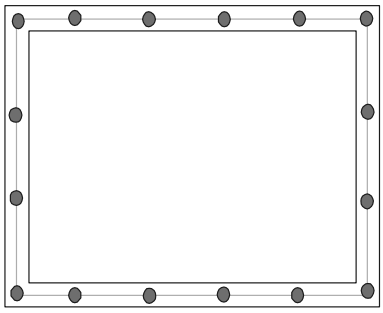


Fig. : 28.5 Rectangular frame

2. Rectangular frame: The rectangular frame consists of four pieces attached to each other in a rectangular form. The fabric to be embroidered is stretched on the frame on all the four sides, where the fabric is tacked onto the end of the frame with the help of needle and the thread.

(f) Fabric : You can create embroidery on any fabric available in the market. Correct use of design, needle and thread on various fabrics can produce lovely embroidered fabrics.

(g) Design : You will need a design to create a good embroidery. We will tell you all about it in the next lesson.

(h) Materials required for transfering design : Equipment and material required for transfering design on fabric are varied. You can do it by using carbon paper, butter paper, tracing paper, pencil, rubber, kerosene oil, cotton etc. You will learn about these techniques in the next lesson.

Activity 28.1 : Prepare a sewing kit for yourself, using the following steps

(i) Prepare a list of articles required for the sewing kit.

(ii) Tick against each item as you keep them in the box.

INTEXT QUESTIONS 28.1

I. Match the following:

i)	Embroidery scissors	a)	Metallic piece to protect finger.
ii)	Thimble	b)	Needle used for embroidering fine fabric.
iii)	Frame	c)	Sharp equipment like tweezers for cutting thread.
iv)	Fine Needle	d)	Needle for embroidery on coarse fabric.
v)	Silk floss	e)	Lower strength than cotton thread.
vi)	Thread clipper	f)	Wooden ring to hold embroidery fabric.
vii)	Resham thread	g)	Sharp and pointed edge for cutting.
viii)	Thick needle	h)	Silk thread with good shine.
		i)	Very strong embroidery thread.

II. Complete the following statements by choosing the correct answer. Justify the statement.

i). A needle size is chosen according to the

a) thickness of fabric
b) texture of fabric
c) colour of fabric
d) weave of fabric

Justification : _____

_____

ii) Thimble helps in protecting the

a) thread
b) needle
c) finger
d) thumb

Justification : _____

_____

iii) Good embroidery can be created by using only

a) cotton threads
b) silk floss
c) silk thread
d) appropriate equipment

Justification : _____

_____

iv) Embroidery scissors must have

a) long and sharp blades

b) pointed sharp blades

c) long and pointed blades

d) Long, pointed and sharp blades

Justification : _____

_____

v) While framing a delicate fabric for embroidery

a) stretch the fabric tight between the hoops

b) wrap the inner hoop with a thin fabric

c) use a mettalic hoop

d) use a wooden hoop

Justification : _____

_____

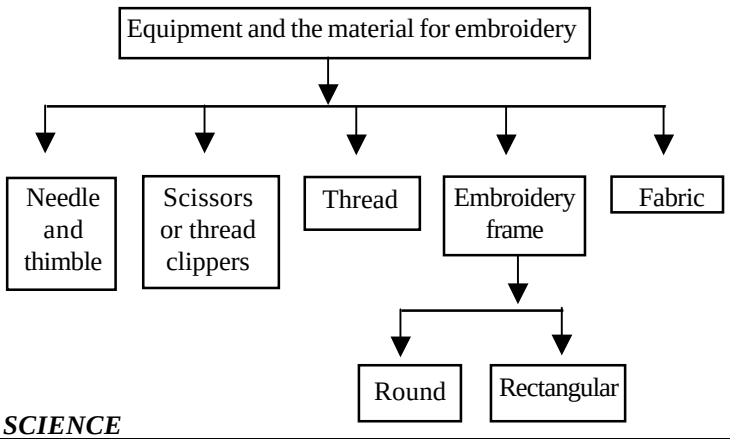
TERMINAL EXERCISE

1. Define the word 'embroidery'.
2. List the equipment required for embroidery.
3. What points will you keep in mind while buying embroidery needles? How will you take care of your needles?
4. List the different kinds of threads that can be used for embroidery.

WHAT YOU HAVE LEARNT

a) Definition of embroidery

b) Equipment and the material for embroidery



ANSWERS TO INTEXT QUESTIONS

I i) g), ii) a), iii) f), iv) b),
v) h), vi) c), vii) e), viii) d)

II i) a, ii) c, iii) d, iv) d,
v) b

Refer 28.2

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THE DESIGN

In the last lesson you learnt about material required for doing embroidery. So what should be the next step? Yes, the selection of appropriate design.

Selection of colours, patterns or design in embroidery depends on individual preferences. However, take care to select a design which is appropriate to age, sex, occasion and need. Now, what is appropriate? Let us see case of this young mother dressed to attend a wedding in summers. She is wearing a fully embroidered bright red saree, decorated with stones, sequins and zari. Can you guess what is wrong with her choice? Yes, during summers she could have chosen a lighter colour. Keeping the age of the baby in mind she could have selected a saree with delicate thread embroidery with decorations only at the bottom of the saree. Decorations like zari, stones, sequins etc., may scratch the baby's delicate skin. Also, it makes the saree heavy. Surely, attending a function feeling hot and bothered, picking up not only the baby but also a heavy saree can not be enjoyable. Do you now understand the meaning of appropriate here? In this lesson, we will learn about designs and their best possible placement on different types of clothes.

OBJECTIVES

After studying this lesson you will be able to:

- describe design and its various types;
- differentiate between motif, pattern and design;
- make possible modifications in the design;
- select appropriate design for embroidery;
- select appropriate method of transferring a design on a fabric;
- determine the suitable placement for the design.

29.1 DESIGN

Design has been defined as "a plan or a drawing produced to show the appearance of something before it is made".

In other words it is the process and art of creating, planning and making a detailed drawing of something to be made. It can be an embroidery design or a furniture design, garment/fashion design, a design for a house to be built etc.

A far as embroidery is concerned we can easily say that design is a decorative pattern which aims at increasing the beauty of the article on which it will be embroidered.

TYPES OF DESIGN

Designs fall into five basic categories–

i) Geometrical designs

ii) Simplified designs

iii) Naturalized designs

iv) Stylized designs

v) Abstract designs

(i) Geometrical designs

Designs created by using various geometrical shapes, such as lines, circles, squares, rectangles, triangles etc. are called geometrical designs. It is possible to draw many man-made objects using geometrical shapes. Look at the hut shown in the design. You must have been drawing this hut since childhood. Can you list the geometrical shapes used in this? Yes these are lines, circles, rectangles, etc.

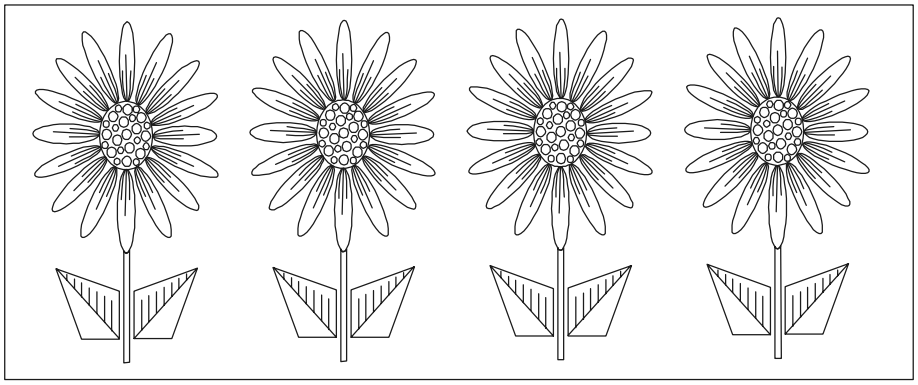


Fig. 29.1: Geometrical designs

The above designs are created using various geometrical shapes, thus are called geometrical designs.

(ii) Simplified designs

These designs comprise of slight curves and few details. See the following designs, observe and compare the geometrical and simplified designs. Simple lines and curves with few details create simplified designs.

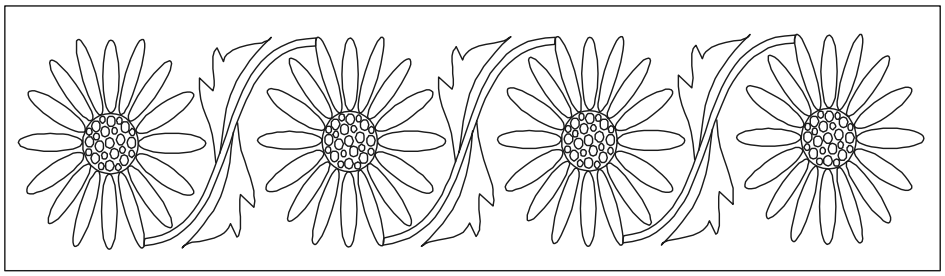


Fig. 29.2 : Simplified designs

(iii) Naturalized designs

As the name suggests, these are the designs inspired from Nature. Patterns in Nature change all the time, different seasons unfold different colours and scenes. Man is inspired by all that is happening around him. You must have seen beautiful flowers, leaves, vines, birds and animals embroidered on different garments very close to natural designs. Thus the pattern in naturalized designs will be very close to Nature.

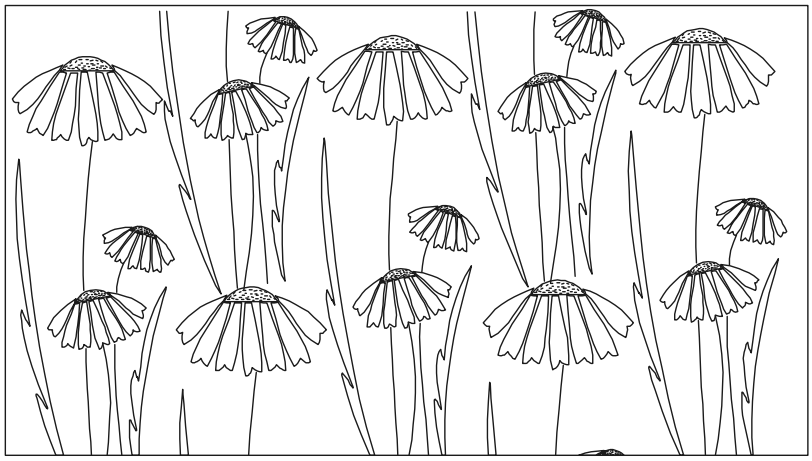


Fig. 29.3: Naturalized designs

(iv) Stylized designs

These are made to make the design look more beautiful. The design loses its natural form as it becomes more decorative and stylized. Thus the designs which have more curves and details and are away from their natural form and look more complicated are called stylized designs.

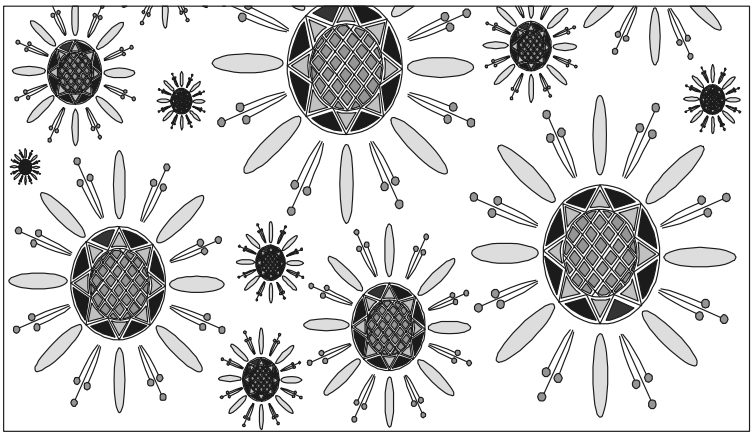


Fig. 29.4: Stylized designs

(v) Abstract

An abstract design does not have any specific inspiration. Both natural and abstract designs use the same source of inspiration but results would be quite different. The natural design of a leaf will look like a leaf but an abstract design of the same can be created by only using its texture, veins, patterns or colour to produce an attractive design. Every day objects, when viewed from different angles, can be an exciting source for abstract designs.

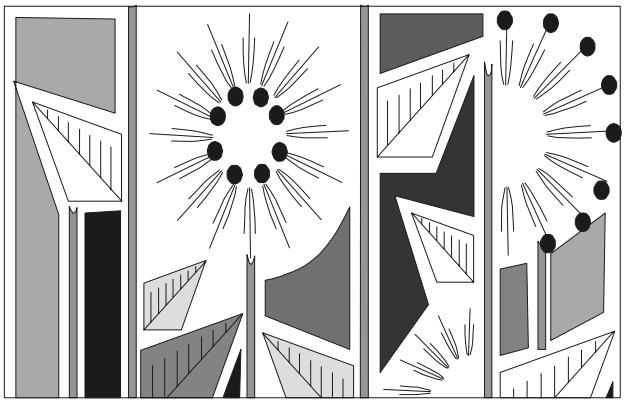


Fig. 29.5 : Abstract design

The following illustration will help you to identify all five different types of designs. Also, it will give you a clear idea of how one type of design can be converted to its other forms.

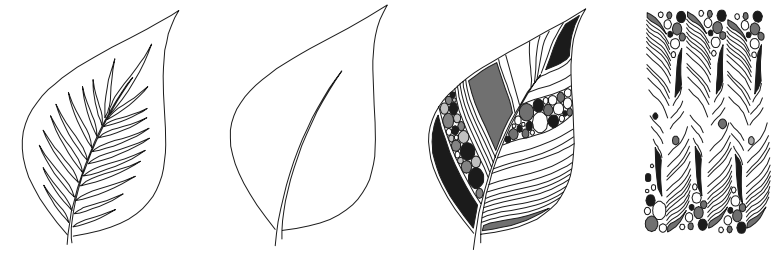


Fig. 29.6 : Leaf in its various forms of design

Activity 29.1 : Create a design directory. Take a practical file in which you can insert work sheets and collect various designs as discussed above. For example, go to the garden and look for shapes which could be used to develop your own design such as leaf, flowers, feather, butterflies etc. Draw them. You can also collect interesting objects like shells, pebbles, drift-wood etc. Pressed leaves, flowers and feathers can be a part of your design directory. Draw at least three design of each type. This directory will be very helpful while developing new ideas.

Hint:

(i) Leaflets and magazines contain illustrations which can be used. Find some, cut and paste them. Suggest how you might use them, Place these in your design directory.

(ii) Create a logo for your tee-shirt using letters cut from newspaper headlines.

(iii) Find and sketch cartoons, illustration of animals, toys etc. Add them to your design directory.

Activity 29.2 : Shown below is the image of a feather in its natural form. Take this as an inspiration to create different types of design.

Inspiration	Design development
	Natural feature **Stylized**
	Simplified **Abstract**

Fig. 29.7: Inspiration

Add these designs in your design directory.

29.2 MOTIF, PATTERN AND DESIGN

Can you draw a train, a cat or stars in a similar way? Probably not. Do you think you can use all three patterns on the same garments? Make a list of garments on which such motifs can be embroidered.

Often the terms design, motif and pattern are used interchangeably. Let us try and understand what each means. You already know the meaning of design. Let's see motif and pattern.

A design starts with a motif. When a motif is repeated at certain intervals over a surface it is called a pattern. Repetition of this pattern creates a design. Certain principles are used when repeating the motif or the pattern to create different design. A look at the following illustration will help you to realize how a motif can be used to make a pattern and the pattern to make a design.

Fig. 29.8 : Motif, pattern and design

INTEXT QUESTIONS 29.1

1. Do you know how to use a dictionary? Find out appropriate meanings for the following words used in the context of embroidery.

   (i) Geometrical (ii) Naturalized (iii) Stylized (iv) Abstract

   Classify the following design as geometrical, naturalized, stylized and abstract.

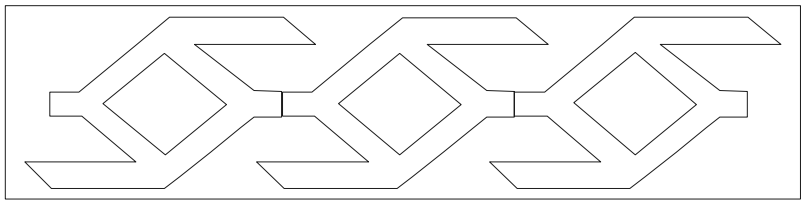


Fig. 29.9 _____

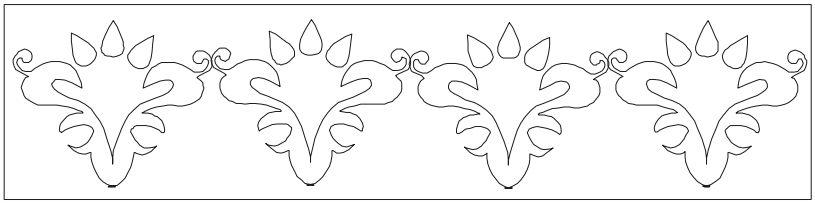


Fig. 29.10 _____

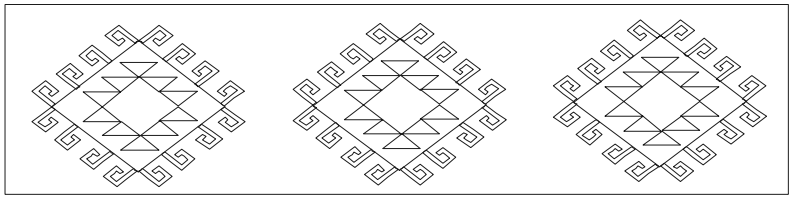


Fig. 29.11

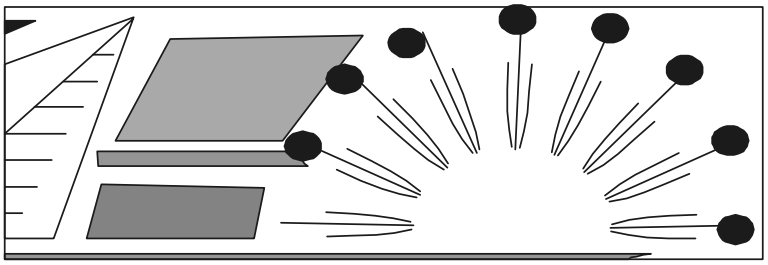


Fig. 29.12

29.3 ENLARGEMENT AND REDUCTION OF A GIVEN DESIGN

Some times, a design may have to be enlarged or reduced. To understand this let us answer this question. What will you do if you have to decorate a diwan cover and a cushion cover with the same motif? Let us say that the motif used is a flower. If you select a large flower, it will look too big on the cushion cover. So, what can you do? You can use a large flower on the diwan cover and the same flower can be reduced to a smaller size for the cushion cover. In this way, the design size can be made appropriate to the article size.

The idea behind enlarging and reducing a design is to be able to use one motif on different sizes and shapes of articles. It sounds very simple but what do you do when you have a complicated design? Then you need a method to enlarge or reduce it. Let us try and learn this method step wise.

Step 1. Find a design that you would like to use in your embroidery.

Step 2. Trace it on a tracing paper.

Step 3. Use a carbon paper to transfer the tracing on to a graph paper.

Step 4. Using the squares as a guide, draw the illustrations on to large squares.

This must be done very carefully. It is only by following the position of the outline on the squares that the drawing stays in proportion; i.e., each part is increased by the same amount in width and height. This is because the squares are of the same shape but are larger in size.

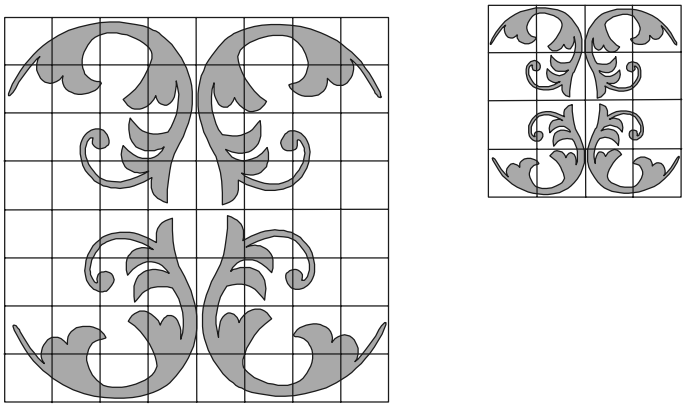
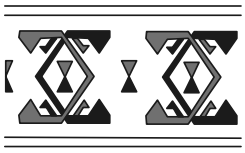


Fig. 29.13: Enlargement and reduction of the design

Activity 29.3

Reduce and enlarge respectively the following motifs according to the graph given.



Reduce →

Fig. 29.14: motif

Enlarge →

Fig. 29.15: motif

29.6 EMBROIDERY DESIGNS

Whenever we select a design we keep the following points in mind.

– The embroidery design must fulfill its purpose, for example, we use a cartoon on children's garments.

– Choose the embroidery design according to shape and size of the garment.

– Select the design according to the texture of the fabric, e.g., light embroidery will be suitable for delicate fabrics like chiffon and heavy embroideries will be more appropriate for thicker fabrics like cotton.

– The design varies with occasion. Heavily embroidered garments are appropriate for a wedding but will definitely look out of place in office.

– The sex of the wearer also influences the selection of the design. A design for women's garment will not look appropriate on a man's garment.

– Select the design keeping the age of the wearer in mind. Certainly what looks appealing on a teenager's dress may not look nice on grandmother's clothes.

– Embroidery design must use the background of the fabric effectively in terms of colour combination and texture.

– Decorate the area near the points of emphasis, e.g., collars, pockets, neckline etc.

– Take care to see that it is comfortable. Embroidered article must not be so heavy that is becomes difficult to carry. Nor should design be abrasive to the skin of the wearer.

In short, the factors you must consider while selecting a design for embroidery are:-

- purpose
- shape and size of the article
- colour and texture of the fabric
- occasion
- sex of the wearer
- age of the wearer
- comfort
- point of emphasis

29.7 PLANNING THE EMBROIDERED ARTICLE

While planning an article to be embroidered there are a number of things you have to keep in mind. If you ask yourself a few simple questions, your task will become easy. These questions are:-

– Who will use it?
– What will it be used for?
– Where will it be used?
– When will it be used?
– How will it be used?

The answers to these questions will let you know what kind of wear and tear is expected on the article and on the embroidery. This will then help you to decide the type of embroidery to be done and the material/fabric that would be appropriate to use.

For example, suppose you are a member of an environment society and you have

to embroider an ecofriendly shopping bag. Let us try and answer the questions listed above before designing this shopping bag.

Table : 29.1 : Planning An Embroidered Article

Questions asked	What will it have to stand up to	Qualities needed	Suggested materials
1. Who will use it?	Constant handling by different age groups	Relate style, size and embroidery to age and interest of the user	Bright coloured or darker shades of fabric
2. What will it be used for?	To carry weight	Light in weight yet strong, water resistant, colour fast, embroidery must not snag.	Strong handles e.g. wooden, or thick, smooth shoulder straps
3. Where will it be used?	Exposed to sun and rain in the market	Fabric and embroidery must be washable, fabric must not be absorbent, or spoiled by being damp.	Canvas, jute etc.
4. When will it be used?	Everyday in bright sunlight without rotting or fading, water resistant, and resilient	Thick and strong fabric, resistant to strong sunlight.	Cotton and terrycot embroidery threads, casement, Khadi fabric.
5. How will it be used?	Rough handling	Suitable size of bag and shoulder straps. Suitable size for all ages, embroidery should be proportionate to the size of the bag.	Cotton casement, jute and strong threads and strong fabric.

Activity 29.4 : Fill in the following tables for embroidering (a) baby's frock (b) wedding lehnga.

Baby's Frock

Question asked	What will it have to stand up to	Qualities needed	Suggested material or fabric
1. Who will use it?			
2. What will it be used for?			
3. Where will it be used?			
4. When will it be used?			
5. How will it be used?			

Wedding lengha

Question asked	What will it have to stand up to	Qualities needed	Suggested material or fabric
1. Who will use it?			
2. What will it be used for?			
3. Where will it be used?			
4. When will it be used?			
5. How will it be used?			

The most important things in embroidery is the design to be embroidered. You can always create your own design. Sometimes, you may like a particular design so much that you want to use it for embroidery. There are a number of ways by which a design can be transferred on to the fabric. You have already learnt that the design can be used in the same size, can be enlarged or reduced according to the requirement. Let us now learn different techniques to transfer the design on to a fabric.

29.4 METHODS OF TRANSFERING A DESIGN

There are 6 main methods of transfering a design.

1. Direct method
2. Using carbon paper
3. Back Tracing
4. Using Butter paper
5. Using a glass plate and light
6. Using a template

Let us learn about each method one by one.

1. Direct Method

Those of you who are good at drawing designs can draw directly on fabric in free hand with a pencil. Direct method can be used conveniently on transparent or thin fabrics like lawn, organdie, nylon, georgette or full voile. Design can be drawn with a pencil keeping the fabric tight in the embroidery hoop.

2. Using Carbon Paper

Red, green, yellow, blue and white carbon papers are available in the market. Here is how you use it to transfer designs.

(i) Place the fabric on a smooth, hard surface and anchor it with a tape.

(ii) Carefully place a carbon paper, carbon side down, between the fabric and the design, secure it with a tape.

(iii) Place the design in the correct position and tape it in place.

(iv) Trace the design with a dry ball-point pen. Use enough pressure to transfer clearly.

(v) Use white or yellow carbon on dark coloured fabric and blue carbon on light coloured or white fabric.

3. Back Tracing

(i) Take a design and drawn it on tracing paper.

(ii) Use bold pencil (2B, 4B) on the back side of the design and go all over the lines of the design.

(iii) The lines should be bold so that when you touch the backside of design carbon should come on the finger.

(iv) Tape the tracing on the fabric so that back side of the design marked by pencil faces the fabric.

(v) Trace all lines using back side of the pencil.

For geometrical or symmetrical design a quarter of it may be drawn on the tracing paper and then the sheet can be folded into half horizontally and vertically and the design can be completed by tracing. This is the simplest method and does not require any costly equipment.

4. Using Butter Paper

This is also called the perforated pattern. This can give you a good permanent pattern, provided you keep it carefully.

(i) Trace the design on a sheet of butter paper. It is easily available in the market.

(ii) With the help of a needle or sharp pin, make small holes along the design lines. You can also run an empty sewing machine over the these lines. Keep the holes close together.

(iii) Mark the placements on the fabric and secure the tracing on it with common pins.

(iv) Mix a small amount of powered blue (neel) in kerosene oil. The mixture should be like a paste.

(v) Dip a ball of cotton in the mixture and rub it over the perforations or holes.

(vi) Remove the paper carefully and blow off any excess powder over the fabric.

5. Using a glass plate and light

(i) Place a piece of plain glass sheet on the arm rests of a chair. Place a lighted bulb under the glass.

(ii) Transfer the design on a thin paper.

(iii) Now put the paper on the glass, lay the fabric on top of the paper and outline directly on the fabric with a hard pencil.

6. Using a Template

A template is a shape which is cut out of card paper. A template can be used when you need to place a simple design many times over a fabric.

i) Take a sheet of card paper.

ii) Draw the shape carefully on it.

iii) Cut out the pattern with a sharp blade. Your template is ready to be used.

iv) Place the template at the correct position on the fabric. Tape it securely.

v) Draw the outline with a pencil. Now remove the tape and then the template.

Try to use all these methods. Gradually, with practice, you will develop the ability to select the appropriate method of transfer for each type of design and fabric. However, working neatly should be your motto. Remember, any stains on your embroidered article will ruin the overall effect.

29.5 DESIGN PLACEMENT

You have learnt about design and its types. Let us now learn the best way to use them to create beautiful work. You will now learn the different ways of placing a design, so that the overall look is enhanced.

Before we start learning about different types of placement let us take the first step. Take the garment that is to be embroidered. Measure it. Now with the help of tailors chalk divide it into equal squares.

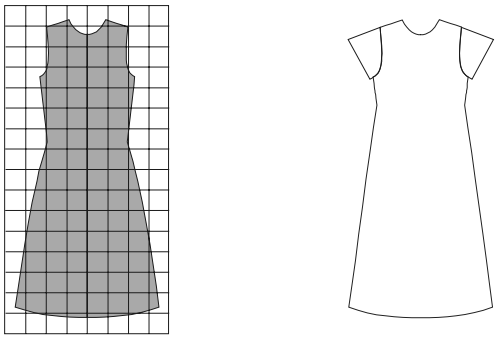


Fig: 29.16 : Marking lines with chalk

Now we shall learn about the placement of the motif, done in the following different ways.

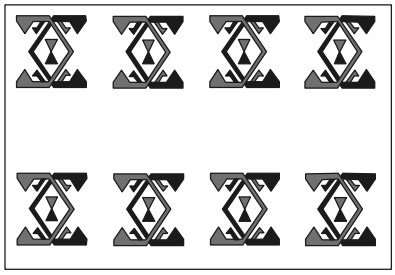


Fig. 29.17 Horizontal placement

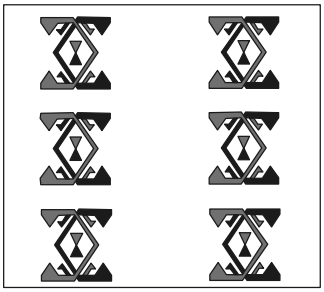


Fig. 29.18 Vertical placement

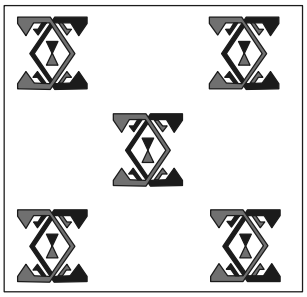


Fig. 29.19 Half drop placement

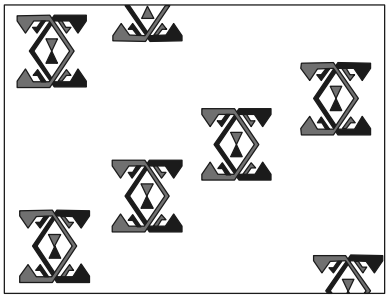


Fig. 29.20 Diagonal placement

Fig. 29.21 Border placement

Activity 29.5

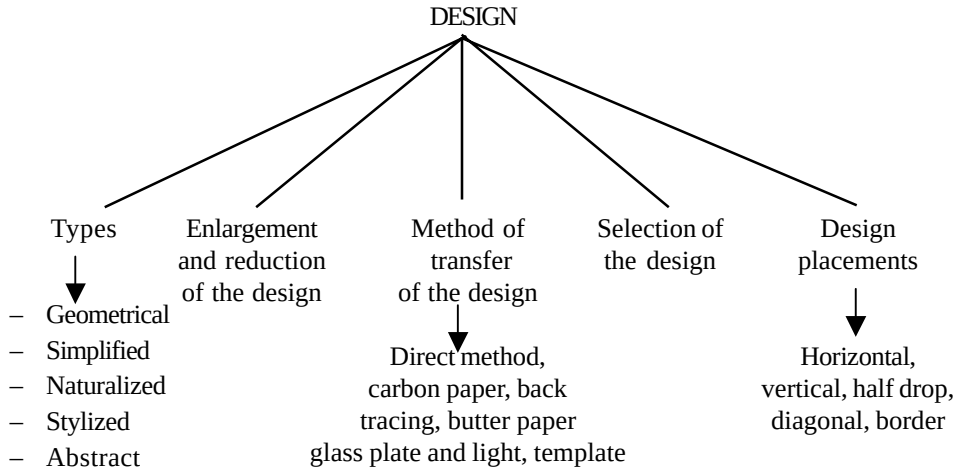
a. Go to the local market / tailor and collect samples of printed fabrics with different placements of design and stick them in your design directory.

b. Place a motif of your choice on the given frock, mention the name of the placement under it. File it in your design directory.

INTEXT QUESTIONS 29.2

1. Rearrange these letters to form words that describe different methods of transferring a design.
   a) EPATELMT (1word) .....
   b) BTCAINGCRKA (2words) .....
   c) RACNOBPPREA (2words) .....
   d) RITCEDMHOETD (2words) .....

WHAT YOU HAVE LEARNT



TERMINAL EXERCISE

1. Identify the following placements.

Fig: 29.26

Fig: 29.27

Fig: 29.28

Fig: 29.30

2. You have to embroider a frock for your three year old niece. List the factors you will keep in mind while selecting a design for it.
3. Describe any two methods of transferring a design from paper onto a fabric.
4. You have selected a design of a butterfly to be used on a bedcover and pillow cover. Explain the method by which the same motif can be used on both the articles. Show it using a graph paper.
5. Select a motif for your father's kurta and show any two ways in which it can be placed on it.

ANSWERS TO INTEXT QUESTIONS

29.1 (i), (iii) Geometrical; (ii), (iv) naturalized (iv), (vii) stylized (v), (viii) Abstract

29.2 1. (a) Template
(b) Back tracing
(c) Carbon paper
(d) Direct method

30

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COLOUR

*T*hink of a world without colour! How would it look? Dull and boring. Colour brings interest and cheerfulness to the surroundings. Colour and motifs play an integral part in creating an attractive piece of embroidery. You have already learnt about motifs or designs in lesson 29. This lesson deals extensively with the various colour schemes that can make your work easy and help you get started. With practice, selection of colours will start coming naturally to you. Have you ever noticed people, men as well as women, practicing this art at home? Some create beautiful colour schemes while some are unable to do so. Who taught them? They not only learnt by observing their elders at home but constant experimenting leads to greater knowledge of the scheme that works.

Let us learn some basics of colour and the combinations they may be used in to produce pleasant effects.

OBJECTIVES

After going through this lesson you will be able to:

- classify colours into different categories;
- draw a colour wheel;
- describe the characteristics of colour;
- identify and explain the various colour schemes;
- explain the symbolic meaning and psychological effect of colour;
- use a colour scheme to colour a motif.

30.1 CLASSIFICATION OF COLOURS

There are numerous colours all around us. The classification of these colours have been devised to organise and identify colours. A most familiar one is the 12 hue "Colour Wheel" (Fig 30.1). These colours can be classified either according to their origin or properties. The most common classifications are as follows:-

1. Primary, Secondary and Tertiary colours
2. Warm and cool colours
3. Neutral colours
4. Metallic colours

1. Primary, Secondary and tertiary colours

Primary colours

The primary colours are red, yellow, and blue. These three colours form the basis from which other colours can be made.

Secondary colours

The colours formed by mixing two primary colours in equal quantities are called secondary colours. These are orange, green, and purple.

Tertiary colours

These are formed by mixing a primary and a secondary colour in equal quantities. For example, blue (primary) and green (secondary) mix to form blue-green (tertiary).

Yellow	+ orange	= yellow orange
Red	+ orange	= red orange
Red	+ purple	= red purple
Blue	+ purple	= blue purple
Blue	+ green	= blue green
Yellow	+ green	= yellow green

The three primary, the three secondary and the six tertiary colours give us our set of twelve colours.

Traditional Indian embroidery uses all these colours in various shades.

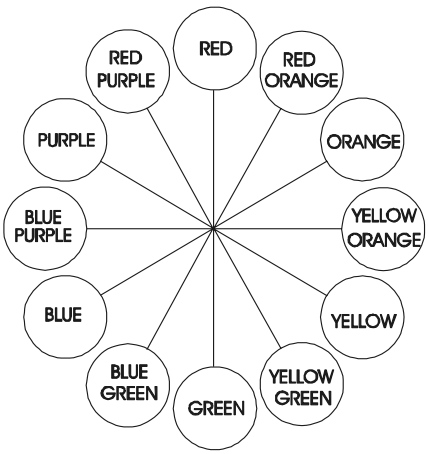


Fig. 30.1 : The colour wheel

Activity 30.1

Draw a circle with a diameter of 6 inches and develop a colour wheel. Place it in your design directory.

Hint: 1 drop blue + 1 drop purple = 2 drops blue purple

2. Warm and Cool colours

Make a colour wheel. Now draw a line vertically down the center of the wheel as shown in the figure. If you split the colour wheel vertically down the center, one side will have all the warm colours and one side will have all the cool colours.

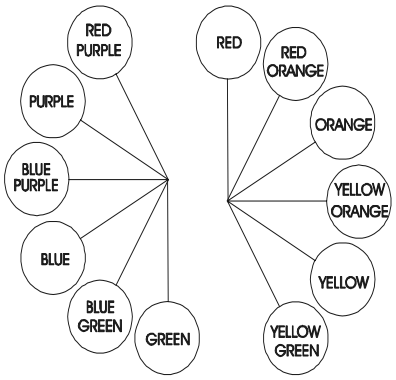


Fig. : 30.2 Warm and cool colours

Warm colours

These are red, orange, yellow, etc. These colours have the element of fire or sun within them. They project a feeling of warmth. They create a visual impact of reduced size and length. These are encouraging colours that produce a feeling of excitement and happiness. You will notice that these colours are very commonly used in traditional Indian embroideries. Since most heavy embroideries are executed for happy occasion like marriage or child birth, selection of such colours is natural.

Cool colours

These are blue, green, purple, etc. They have the element of vegetation or water in them. They project a cool feeling. These are peaceful colours that give a feeling of rest and repose. They also create a visual impact of enhanced size and length. These colours can be used to create embroidered pieces for summers. They also provide a balance to vibrant warm colours. Warm and cool colours are complementary to each other and always create very interesting effects.

The warmth and coolness of colours like green and purple, which are formed by mixing one warm and one cool colour are dependent upon the amount of primary colour used to prepare the secondary colour.

3. Neutral colours

Did you notice that we have not talked about white, black, grey, brown, tan, beige etc. These are called neutral colours. They are a very important part of any embroidery. They form a very effective background for bright colours. Whenever we are not sure of a right colour scheme, neutral colours come in very handy.

4. Metallic colours

The sparkle and shimmer of metal is always attractive to man. Metal wires were hammered to fineness of a yarn and used in the embroidery. Plain golden or silver wires are called 'Badla' and when these wires are wound around a thread they are called 'Kasab', spangles of metal are 'Sitara' and tiny dots made out of badla are called 'Mukaish'.

The days of using real gold or silver are now history, what you now get is synthetic zari or 'tested zari'.

INTEXT QUESTIONS 30.1

I Fill in the blanks –

1. Red, _____ and _____ are primary colours.
2. Brown, beige and tan are _____ colours.
3. Tertiary colours are obtained by mixing one _____ and one _____ colour.
4. _____ colours form effective background for dark colours.
5. Orange colour can give you a feeling of _____ during winters.

II Complete the equation

1. Red + Blue = _____
2. Yellow + _____ = Yellow orange.
3. _____ + Green = Blue green.

30.2 CHARACTERISTICS OF COLOUR

Just like every object has three dimensions i.e., length, breadth and height, colour also has three dimensions. They are described by using the terms **hue, value** and **intensity**.

Hue: Refers to the name of the colour e.g. red, orange, blue etc.

Value: Refers to the lightness or darkness of a hue. By adding white to a hue a lighter colour can be obtained. It is called **tint.** By adding black to a hue a darker colour can be obtained. It is called shade or **tone**. Henceforward, we shall refer to all the light shades as tints and dark shades as tones. Tints and tones are specially useful when you are embroidering a natural design eg. - if you have to embroider a flower, you can use the hue along with two tints and one tone. Motifs like fruits, birds, nature scene etc. can all be embroidered in a similar fashion.

Intensity refers to the brightness or dullness of a colour. If all the colours used in embroidery are bright or dull a balanced look will not be created. So, it is a good idea to use both dull and bright colours in the correct proportions, for example red and golden yellow flowers can be balanced by tints of green leaves and brown stems. To increase the intensity of a colour place the complementary colours next to each other. This kind of placement produces very bright colour schemes, for example, red and parrot green.

Activity 30.2: Market Survey: Conduct a market survey on various colours of embroidery threads available in the market. Collect and paste at least 3 embroidery threads in your file according to the following categories.

1. Primary colour
2. Secondary colour
3. Tertiary colour
4. Warm colour
5. Cool colour
6. Metallic colour

Activity 30.3: Paste embroidery threads of at least 5 tints and 5 tones of one primary colour in your file.

INTEXT QUESTIONS 30.2

1. Give one word for the following.
   1. Brightness or dullness of colour. _____
   2. Lightness or darkness of colour. _____
   3. Technical name of the colour. _____
   4. A lighter colour. _____
   5. A darker colour. _____

30.3 COLOUR SCHEMES

A colour combination that matches and looks pleasing to the eye is called a colour scheme. Whenever more than one colour is placed next to another, a scheme is automatically created.

There is a definite scheme through which you can always produce pleasing effects when more than one colour is used. These colour schemes could be:

1) Monochromatic colour scheme
2) Analogous colour scheme
3) Complementary

Notes

4) Split complementary

5) Triad

6) Tetrad

1) A Monochromatic colour scheme uses a single colour. It consists of tints and shades of the same colour e.g. on a pale blue kurta you may embroider sky-blue, dark blue and navy blue motifs or Lucknow chikankari where white motifs are embroidered on white fabric. This kind of scheme is quite restful, easiest to produce and is always successful.

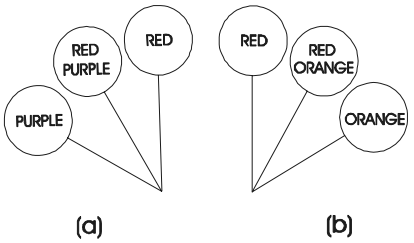


Fig. 30.3

Skin or loosely coiled length of thread

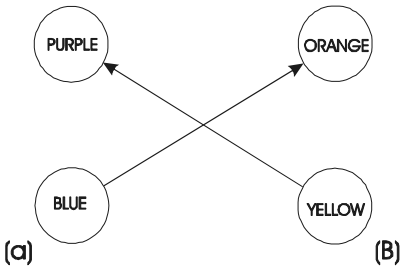


Fig. 30.4

2) An analogous colour scheme is also called adjacent colour scheme. It uses adjacent or neighboring colours on a colour wheel. Such colours have at least one hue in common. E.g. yellow flowers, yellow green leaves and green stems can be embroidered. It is a very pleasing combination. If you add a dash of blue green embroidery or sequins to it, it will become very eye catching and exciting.

3) Complementary colour scheme: It is a two colour scheme. In this scheme colours that are placed opposite to each other in a colour wheel e.g. red and green, are used.

Look at the colour wheel that you have made. Can you find how many such pairs are formed? Yes, you are right. The twelve colours in the wheel will give us six such pairs. Let us list them:

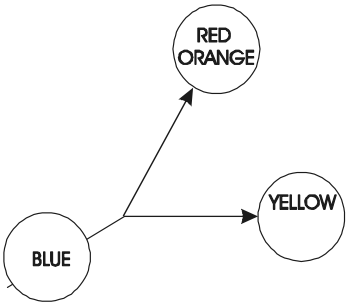


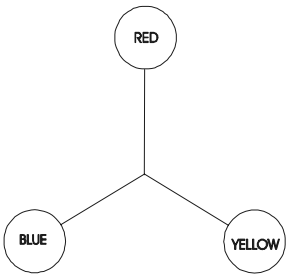
Fig. 30.5

- Yellow and purple
- Orange and blue
- Red and Green
- Yellow green and red purple
- Blue green and red orange
- Blue purple and yellow orange

This colour scheme results in a very bright and cheerful colour combination. This is especially suitable for children-wear and garments for happy occasions like

marriages. If you change the value or intensity of these colours then the scheme can be used for older people or for summers for example, a lemon suit with lilac embroidery will look refreshingly cool during summers. While using the complementary colours take care to see that one colour is prominent while the other remains subdued.

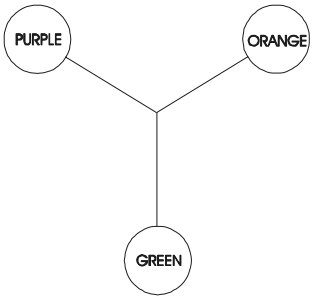
4) Split complementary colour scheme: It is a three colour scheme. It is made by using any one colour and splitting its complementary colours into two parts e.g. yellow, red purple and blue purple, (Purple is the complementary colour for yellow).



(A)

Fig. 30.6

You can embroider a yellow, orange and red orange sun with blue clouds on a child's frock. Again, you will see that by changing the value and intensity of the split complementary scheme, it can be made suitable for all types of ages, occasions and seasons.



(B)

Fig. 30.7

5) Triad colour scheme: It is a three colour scheme. It combines any three colours that form an equilateral triangle on the colour wheel. eg: yellow, red and blue or orange, green and purple.

An equilateral triangle is a triangle in which all three sides are equal.

6) Tetrad: This is a four colour scheme. It combines any four colours that form a square on a colour wheel. These schemes are being used in Kashida of Jammu and Kashmir, Kantha of Bengal and Chamba Rumal of Himachal.

Example: Green, yellow orange, red and blue purple.

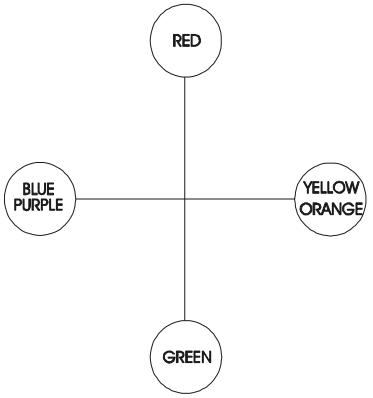


Fig. 30.8

The choice of colour is the most important decision a designer will make. Before making that decision the effect of combining colours and the impact that each colour will have both individually and when combined with others, needs to be considered.

If two colours appear striking when used together they are said to **contrast** well. Complementary colours contrast well. A good contrast also occurs when light and dark shades of two colours are used e.g. pale yellow and dark red. The excellent contrast of black with white is an extreme example of this principle.

Contrasts can be emphasized by using black or white outline on a motif. It is seen that a white border seems to deepen a colour. If you give a design a black border it will appear to lighten and brighten the entire design. Black or white line separating colours makes each colour show up more.

Colours from the same area of the colour wheel go well together, i.e., they produce a pleasing overall effect called harmony.

Pastel yellow and deep green, or pale pink and purple, are examples of harmonious colours going well to produce a gentle and pleasing effect.

Activity 30.4: Using a shade card or skeins of embroidery thread, experiment with colour to find harmonious and contrasting combinations. Show at least 5 colour combinations each with the help of colour diagrams, in your note book.

INTEXT QUESTIONS 30.3

I State whether the following statements are true or false.

1. Monochromatic colour scheme consists of tints and shades of the same colour.
2. Red, blue-green and yellow-green form a tetrad colour scheme.
3. Colours that are opposite each other in the colour wheel are known as complementary colours.
4. Split complementary colour scheme is placed equilaterally on the colour wheel.
5. Analogous is also known as adjacent colour scheme.

II Match the statements in Column A with those in Column B.

Column A	Column B
1. Yellow and purple	(a) Split complementary colours
2. Yellow, red-purple, blue-purple	(b) Triad colour scheme
3. Red, yellow, blue	(c) Tetrad colour scheme
4. Green, Yellow-orange, red, blue-purple	(d) Complementary colours
	(e) Monochromatic colour scheme

30.5 SIGNIFICANCE OF COLOURS IN DAILY LIFE

The history of colour is as old as the history of mankind. Colour, for primitive man, possessed magical properties. Long before man wore clothes, the body was adorned with colours from natural sources like berries.

Different colours have different meanings. Each colour has a different psychological effect on us. Red – out of fire-means heat to us, green-out of freshly sprouted plants – means freshness and gold – out of sunlight – means gaiety. Colours have different meaning in different parts of the world. For example, in the western world, people grieve in black but in India and China people mourn their dead in white. Even in India some brides wear red whereas in certain areas girls get married in white and gold/red. Let us study these effects so that we can use these colours effectively.

Colour	Effect
Dark red	Love, health, vitality
Bright red	Passion, danger
Dark gray red	Evil
Pink	Femininity, festivity, delicacy, innocence
Orange	Ambition, enthusiasm
Brown	Utility, maturity
Yellow	Inspiration, wisdom, gaiety
Dark gold	Luxury, riches
Light yellow, green	Freshness, youth
Blue	Calmness, sincerity, idealism
Purple	Magnificence, royalty

30.6 FACTORS INFLUENCING THE USE OF COLOURS IN DAILY LIFE

- Age of person
- Sex of the person using the colour
- Profession
- Occasion
- Season
- Type of garment
- Body structure of person

Whenever you have to make a selection of colour for a person, you must take into account the person's age and sex. Children and young adults look better in brighter

colours. Older people must appear responsible, so you could choose those kinds of colours for them. Men must look mature and keeping their job profile in mind may have to project an image of dependability and sternness. So, choose colours accordingly.

Occasion also plays a very important role in selection of colour. Before deciding on a colour, make sure that you know what the occasion is-if it is a marriage or a party, whether it is a morning function or an evening one.

Choice of colours is very largely dependent upon the season too. Time and again we have talked about using cool, fresh and soft colours during summers. One can use bright, dark and cheerful colours in winters. The type of the garment also has an influence on the selection of colour. Choice of colour for embroidery on a western outfit will definitely be different from those used on a sari or lehnga. Before deciding on the colour, check a person's height and weight. Check out special body features like long legs, short waist or large hips. A deep knowledge and understanding of colours can help you emphasize good features.

Colour is the most effective tool in your hand-a tool by which you can create the most harmonious and flattering effects. All you have to do is to practice to achieve good results.

INTEXT QUESTIONS 30.4

I Indicate the colours you think are most suitable for the following:

i) wedding dress of a bride in your area : _____

ii) a girl's frock: _____

iii) salwar kurta worn in summer: _____

iv) gents kurta worn in winter: _____

v) curtains in children's room: _____

vi) bed cover in bedroom: _____

vii) king's dress for a child's fancy dress show: _____

TERMINAL EXERCISE

1. What are related colour schemes? Explain with the help of a colour wheel.
2. List the various factors influencing the choice of colours. Explain giving examples.
3. List the similarities and differences between complementary and split complementary colour scheme.

4. Consider the given situation then answer the following questions.

   Situation: a middle-aged man is wearing a navy blue three piece suit for an evening party.

   a) Name two different colours of the shirt in monochromatic colour scheme and analogous colour scheme.

   b) Name the complementary colour for tie and pocket-handkerchief.

5. What is the relationship between primary, secondary and teritary colours? Using a colour wheel, show how tertiary colours are prepared.

6. In a square of size 8 by 8 inches draw a composition of different geometrical shapes. Now colour the design in: a) Primary colours b) Tertiary colours

WHAT YOU HAVE LEARNT

Colour

- **Colour Wheel**
  - Primary Colours
  - Secondary
  - Tertiary
  - Warm/cool
  - Neutral
  - Mettalic
- **Characteristics of colour**
  - Hue
  - Value
  - Intensity
- **Colour Schemes**
  - Monochromatic
  - Analogous
  - Complementary
  - Split complementary
  - Triad
  - Tetrad
- **Factors influencing the use of colour**
  - Age
  - Sex
  - Job profile
  - Occasion
  - Season
  - Type of garment

ANSWERS TO IN TEXT QUESTIONS

30.1 I
1. Yellow, blue
2. Neutral
3. Primary, secondary
4. Neutral
5. Warmth

II
1. Purple
2. Orange
3. Blue

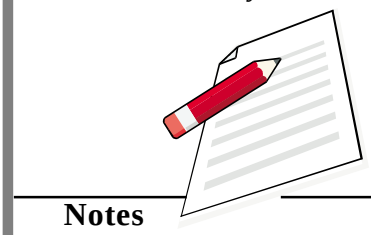
30.2
1. Intensity
2. value
3. hue

4. tint
5. Shade/tone

30.3 I
1. True
2. False
3. True
4. False
5. True

II 1. (d) 2. (a) 3. (b) 4. (c)

30.4 i) red / white ii) pink iii) yellow / green / blue
iv) brown / grey v) orange / yellow vi) blue,
vii) purple / gold



31

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EMBROIDERY STITCHES

Embroidery is decoration worked on the surface of the fabric using thread. You can do this by careful selection of design, embroidery stitches and colours and a very striking effect can be created. Old clothes can get a new lease of life by adding just a dash of embroidery.

All basic embroidery stitches are easy. What may appear to be a difficult or complicated work is a result of a well thought out plan. Several basic stitches can be combined to produce a rich embroidered piece.

Once you have successfully gone through the earlier lessons of this module, you should be able to answer the following queries in the affirmative.

- Is my embroidery piece complete?
- Have I selected an appropriate design for the article to be embroidered?
- Has the design/motif been appropriately enlarged or reduced?
- Have I selected the right transfer technique?
- Is the selection of embroidery threads in accordance with the principle of colour schemes?

Once all these questions are answered with a firm yes, your work of selecting the correct embroidery stitch begins. Let us now learn about the different types of embroidery stitches.

OBJECTIVES

After studying this lesson you will be able to:

- demonstrate the correct method of starting an embroidery;
- excute the basic ten stitches;
- give the right finish to the embroidered article;

Notes

If you are planning to start on a big piece of embroidery, it is advisable to buy all the embroidery threads beforehand as even a slight change of shade can spoil the effect.

- demonstrate the correct method of working each embroidery stitch;
- select appropriate stitches for embroidering the design selected.

31.1 STARTING THE EMBROIDERY

Once you have put together a complete embroidery kit, decided on the fabric, design and colours for the embroidery threads, you are ready to begin. Before starting the embroidery, remember to wash and wipe your hands. This would help in keeping your embroidery clean and fresh. If your hands have a tendency to perspire, you may wash your hands repeatedly. While working on the embroidery you may notice that the thread twists and knots. In this case you can turn the needle in the opposite direction till the thread is smooth. In case the thread does not run smoothly, it will be better to use a fresh length of thread.Always start an embroidery with a back stitch. Never start your work with a knot.

Back Stitch: It is a very strong stitch. It is worked from right to left on the wrong side of the embroidery. Thread a needle. Insert the needle from where the embroidery is to begin, pick a few threads of the fabric and pull the needle and thread through. Repeat this process again at the same place picking a few extra threads of the fabric.

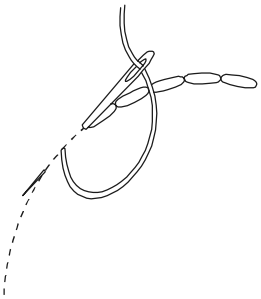

Fig. 31.1: Back stitch

31.2 BASIC STITCHES

In this lesson we are going to learn the ten basic, most commonly used stitches of embroidery. These stitches have been used for many centuries all over the world. However, the changing fashion scene influences the way in which they are used.

(i) Stem Stitch : Stem stitch is basically an outline stitch. This stitch makes a fine line and is used around edges and for making veins in leaves, stems etc.

In this, the needle is inserted to the right of the line and brought up to the left of the line, making a thick outline. The stitch may be used as a filling by working rows alongside each other.

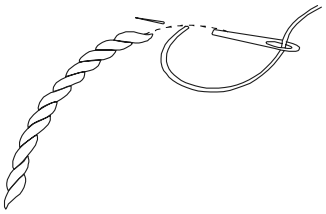

Fig. 31.2: Stem stitch

(ii) Satin Stitch : It is basically a filling stitch. The thread is taken out in front and back equally. It gives a very smooth finish to the embroidery. These are straight stitches worked slantwise. For straight areas, work slantwise from top to bottom; for a small circle, work long stitches vertically, centre first, then fill each side; for leaf shapes, work diagonally, starting from the left edge.

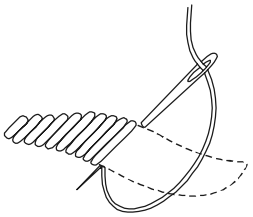

Fig. 31.3: Satin stitch

(iii) Long and Short Stitch : This is used to fill areas in solid and shaded colours. The first row is alternating long and short stitches. The following rows are stitches of equal length worked at ends of short and long stitches. Regularity of the following rows depends on the shape to be filled. Plan the stitches in an area so they fill it naturally and gracefully. It is helpful to mark with pencil the direction of some of the stitches. Here also, the needle works equally in the front and back of the fabric.

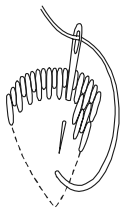

Fig. 31.4 : Long and short stitch

(iv) Chain Stitch : This stitch appears like a chain on the face of the fabric. It is worked from top down. Bring the needle up through the fabric; hold the loop with your thumb and insert the needle again at the same point. Bring the needle up a short distance away, with the thread looped under needle; repeat. It is used for heavy outlines or as a filling, making rows of chain following the outline of the shape being filled.

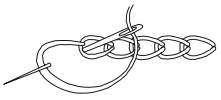

Fig. 31.5 : Chain stitch

(v) Darning Stitch : It is also a filling stitch where the stitch is visible only on the face of the fabric.

The needle is taken out in front, one float is taken then the needle goes down and is taken out from the back through the very next yarn in the same row unlike in the satin stitch where floats of thread are the same in front and back. Here only the front has floats.

(vi) Herring Bone Stitch : Also known as Machali Tanka in Hindi. It is worked between the lines. Bring the thread up through the lower line, insert the needle in the upper line, a little to the right and take a short stitch to the left. Insert the needle on lower line a little to the right and take a short stitch to the left. May be used for thick seams or to connect two solid areas for softening the effect. It finally seems that the lower and upper threads are interlacing with each other.

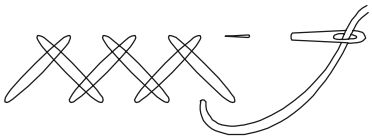

Fig. 31.6 : Herring bone stitch

(vii) Button Hole Stitch : The most common identification of this stitch is the opening into which the button of a shirt is closed. The edge of that opening is finished using a stitch known as the button hole stitch. It is worked from left to right. Bring the needle up through the fabric. Holding the thread under the left thumb, form a loop; then pass the needle through the fabric and over the looped thread; repeat. These stitches are made very close to each other.

This stitch may be used for filling an area or finishing edges and specially the edges in a patch work.

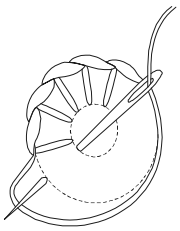

Fig. 31.7 : Button hole stitch

(viii) Blanket Stitch : This stitch is very similar to the button hole. The only difference is that the stitches are a little distance apart. The edges of blankets carpets, etc., are finished by this stitch.

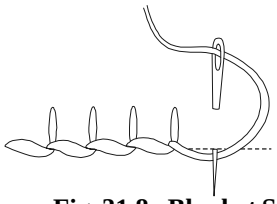

Fig. 31.8 : Blanket Stitch

(ix) Cross Stitch : These are stitches which from x's on the face of the fabric. They are worked from top to bottom - with the needle pointing left, make a row of small horizontal stitches spaced as far apart as they are long. Pull the thread firmly, this produces diagonal floats between stitches; when the row is finished, reverse, working stitches from bottom to top - still with your needle pointing left. Thread floats should cross in the middle forming an "x".

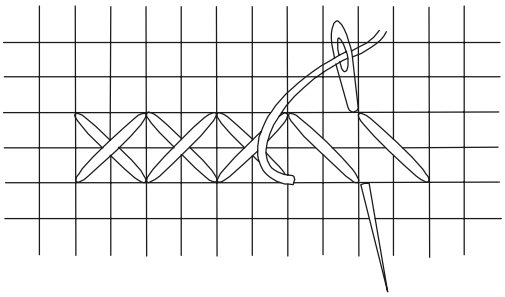

Fig. 31.9: Cross stitch

(x) French Knot : For making a French knot bring the thread up through the fabric, wrap the thread over and under the needle, crossing the beginning thread, insert the needle into the fabric close to where it came up. A double thread may be used to make larger knots if desired.

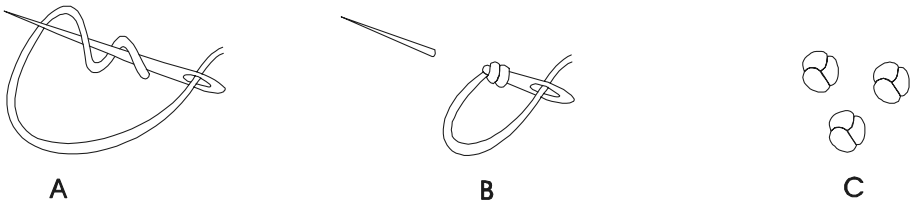

Fig. 31.10 : French Knot

31.3 FINISHING OF THE EMBROIDERED ARTICLE

During the embroidery and once it has been done, a final finish has to be given to the embroidered article, to make it look neater and presentable. For this, you can observe the following points:-

i) Do not end the embroidery in a big knot. Keep the back of the embroidered article as neat as the front.

ii) Clip the extra threads at the back.

iii) Wash/dryclean the article after embroidery as handling during embroidering makes it dirty.

iv) Starch and then iron the article well.

v) Finish the edges of the article appropriately by hemming, picotting, etc.

vi) If your article is heavily embroidered, store after folding it in mulmul cloth.

Activity 31.1

I. Take a rectangular piece of a cotton fabric, needle, cotton thread (2 to 3 ply), scissors, paper and pen.

Execute all the stitches explained to you in the lesson, on the fabric and name each stitch. Maintain this fabric sample as a reference for future use.

Activity 31.2

Once you have executed all the stitches on this sample piece, pick up any five stitches and make a beautiful sample or select stitches and execute them on two handkerchiefs.

1. Think and list under each category, one thing that begins with every letter. For example to answer to first one is Design. See if you can name the others.

(a) To begin your, embroidery you must have

i) D _____ ii) F_____ iii) T_____

(b) These are filling stitches.

i) S_____ ii) L_____ iii) D_____

(c) Careful selection of these will give striking results.

i) D_____ ii) E_____ iii) C_____

TERMINAL EXERCISE

1. Uma is embroidering a baby blanket with butterflies in multicolour.

   a) Suggest two stitches that she can use to fill up the motif of the butterfly. Give reasons for your choice.

   b) Which embroidery stitch should she use to finish the edge? Why?

2. You are making a shopping bag in matte. Which stitch would you see in the embroidery? Why?

WHAT YOU HAVE LEARNT

Embroidery —start with→ Back Stitch

↓

Basic embroidery stitches

↓

Stem Stitch
Satin Stitch
Long and short
Chain Stitch
Darning Stitch
Herring bone
Button hole
Blanket stitch
Cross stitch
French knot

Remember to finish the embroidered article

ANSWERS TO INTEXT QUESTIONS

31.1 (a) (i) Design (ii) Fabric (iii) Threads

(b) (i) Satin Stitch (ii) Long and Short Stitch (iii) Darning Stitch

(c) (i) Design (ii) Embroidery stitch (iii) Colors